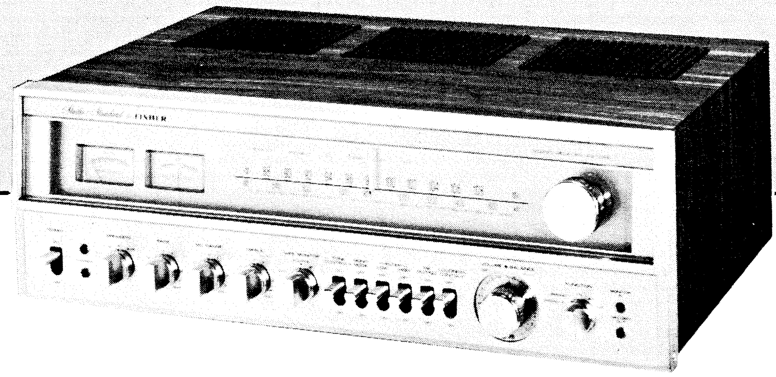
SERVICE MANUAL

FISHER

RS-1056E

Stereo Receiver

(EUROPE)



The first name in high fidelity

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DISASSEMBLY INSTRUCTIONS

Removal of Chassis from Cabinet

1. Remove 4 screws from left and right sides of cabinet.
2. Separate cabinet from chassis.
3. Remove 18 screws from bottom of cabinet. (Do Not Remove Leg From Bottom Of Cabinet).
4. Separate bottom of cabinet from chassis.

Removal of Front Panel Assembly

1. Remove all Knobs
2. Remove 4 screws from top of panel.
3. Remove 5 screws from bottom of Panel.
4. Remove nut from "Function", "Speaker" and "Tape monitor" switches located on Front Panel Assembly.
5. Separate Front Panel Assembly from chassis.

Removal of Meters

1. Remove One screw and Meter Cover.
2. Unsolder leads from meter terminals.
3. Grasp Meter firmly and pull back separating Meter from panel.

Removal of Slide Rail Pointer

1. Remove Metal Slide Pointer from Slide Rail Pointer.
2. Remove 2 screws from top of Slide Rail Pointer.

Removal of AM-FM Stereo Function Indicator Lamps

1. Grasp base of lamp with long-nosed Pliers and Carefully extract from grommet holder.
2. Unsolder AM-FM Indicator Lamp from P.C. Board.

Removal and Replacement of Dial Lamps

1. Remove Dial P.C. Board from Shelter Light with two flaps straight.
2. Grasp Dial Lamp and extract from lamp grommet holder.

Removal of Front End

1. Unscrew 2 screws from Drum. (Do Not Remove Dial String From Drum).
2. Remove 4 screws releasing clip holding Front End.
3. Remove 4 screws from bottom of Front End.

Testing and troubleshooting any of the P.C. boards do not require removal since all component parts are top board mounted. For underneath board inspection purposes or when a defective component is to be unsoldered and replaced, the P.C. board can be sufficiently turned over by only removing the hold down hardware. Where it necessitates complete removal of any individual board then proceed as follows.

Removal of AM-FM RF/IF/MPX Amp P.C. Board

1. Unsolder wire wraps from terminals.
2. Remove 4 hold down screws.

Removal of Power Amp P.C. Board

1. Unsolder wire wraps from terminals.
2. Remove 5 hold down screws.

Removal of Power Supply P.C. Board

1. Unsolder wire wraps from terminals.
2. Remove 4 hold down screws.

Removal of EQ-Amp P.C. Board

1. Unsolder wire wraps from termianls.
2. Remove 5 hold down screws.

Removal of Speaker Protection P.C. Board

1. Unsolder wire wraps from terminals.
2. Remove 5 hold down screws.

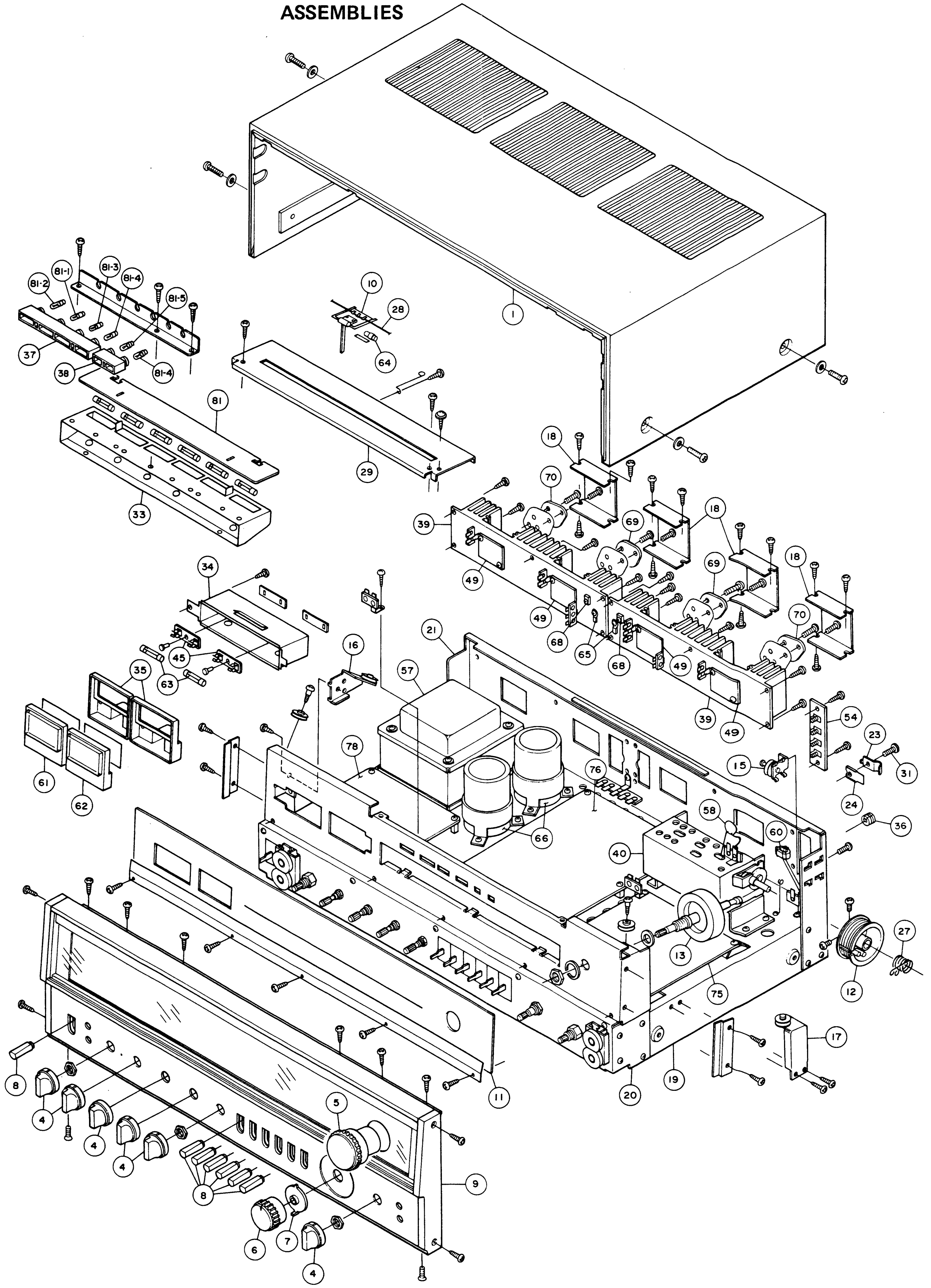
Removal of Tone Control Amp P.C. Board

1. Unsolder wire wraps from terminals.
2. Remove 6 screws from 6 Lever switch.
3. Remove 3 nuts from variable resistors.

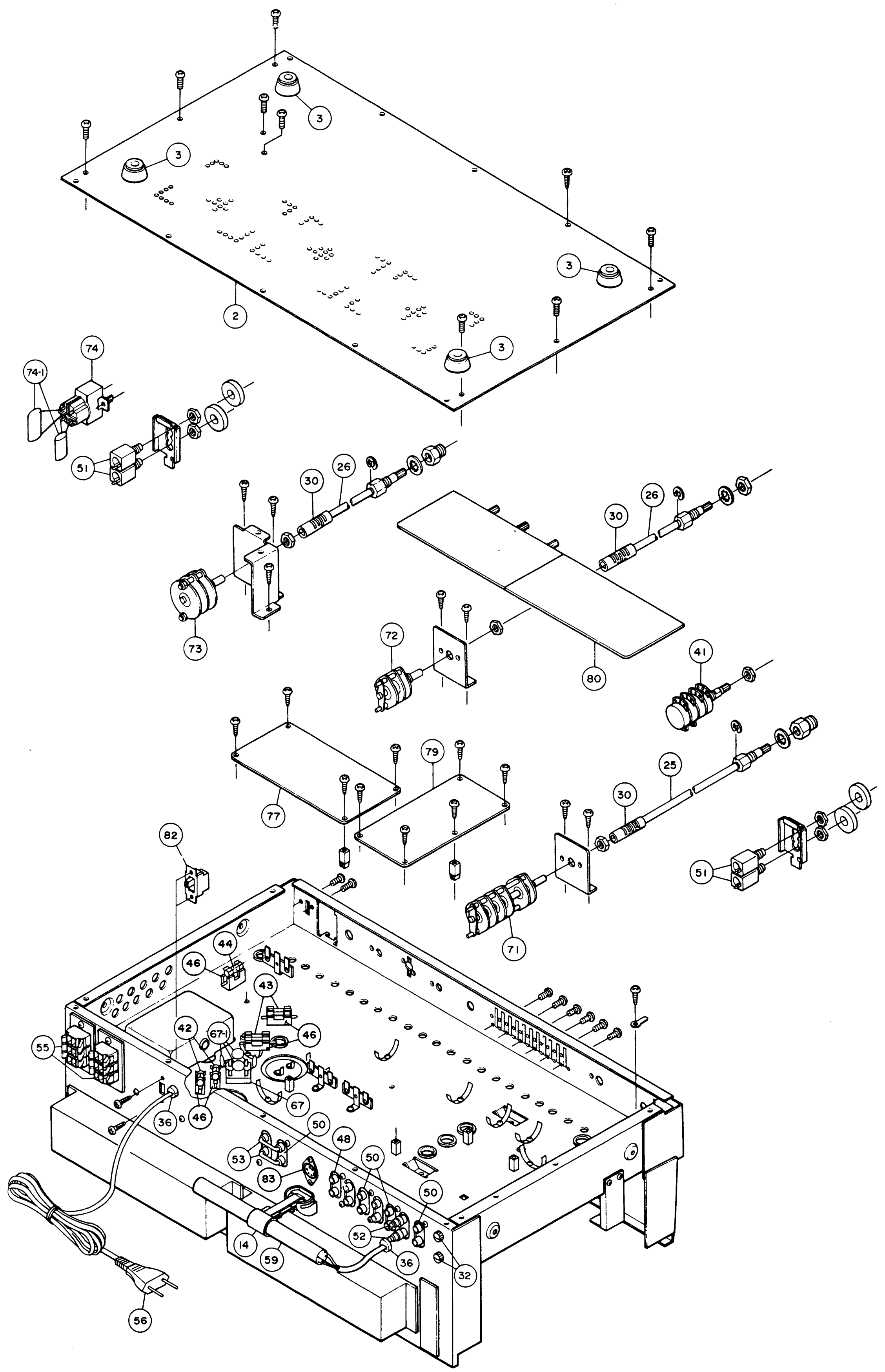
Removal of Power Transistor (Q01~Q04)

1. Remove Cover 4 screws from top and bottom of Plate Heat Sink.
2. Remove 2 screws holding Power Transistor.

EXPLODED VIEW OF CABINET AND CHASSIS FRONT & REAR MOUNTED ASSEMBLIES



EXPLODED VIEW OF CHASSIS BOTTOM MOUNTED ASSEMBLIES



PARTS LIST

CABINET PARTS LIST

Ref. No.	Part Number	Description
1	1310 1101 08700	Cabinet Assy
2 *	1312 1105 17800	Plate Bottom
3 *	1312 1801 13200	Leg

APPEARANCE PARTS LIST

Ref. No.	Part Number	Description
4	1310 1001 35500	Knob, Controls
5	1310 1001 41500	Knob, Tuning
6	1310 1001 36000	Knob, Volume
7	1312 1601 40400	Knoh, Balance
8	1310 1001 36100	Knob, Lever Switch
9	1310 1016 24902	Panel Decorate Assy
10	1310 3011 16800	Dial Pointer Assy
11	1312 1201 28500	Plate Dial

CHASSIS PARTS LIST

Ref. No.	Part Number	Description
12	1310 3002 11300	Drum Assy Tuning Gang
13	1310 3003 19100	Tuning Shaft Assy
14	1310 3008 11900	Support, Antenna Assy
15 *	1310 3020 05800	Pulley Assy Panel Rear
16 *	1310 3020 07400	Pulley Assy Panel Front (Left)
17 *	1310 3020 07500	Pulley Assy Chassis (Right)
18	1312 1410 15100	Cover Power Transistor
19 *	1312 3301 21900	Chassis
20 *	1312 3305 20300	Panel Front
21 *	1312 3306 22618	Panel Rear
23	1312 3621 00400	Clamp, 75 ohm Coax.
24	1312 3621 00500	Base, Coax. Clamp
25	1312 4103 11400	Metal Shaft Rotary SW (Long)
26	1312 4103 11500	Metal Shaft Rotary SW (Short)
27	1312 4111 00400	Tension Spring
28	1312 4112 10200	Dial Cord
29	1312 4120 11700	Slide Rail Dial Pointer
30	1312 4121 00100	Coupling (Nylon)
31	1312 4201 12701	Screw, Panel Rear
32	1312 4201 15400	Screw, Panel Rear (Ground)
33	1312 6110 23701	Housing, Dial Lamp P.C.B.
34	1312 6110 26100	Housing, Meter Lamp
35	1312 6110 26200	Housing, Meter
36	1312 6111 14200	Bushing, Line Cord, AM ANT
37	1312 6111 19700	Housing, Function IND. Lamp
38	1312 6111 19800	Housing, AM, AUX, IND lamp
39	1312 6201 23100	Heat Sink

ELECTRICAL PARTS LIST

Ref. No.	Part Number	Description
40	4 1259 20390	Front End
(Component parts used in Front End are not serviceable and available.)		
41	4 2229 25490	VR A-50k, MN-250k
42	4 2349 21570	Fuse 6.3AT (+, –B)
43	4 2349 20380	Fuse 1.0AT (+, –20V)
44	4 2349 20590	Fuse 4.0AT (6.3V)
45	4 2359 20160	Holder Lamp
46	4 2359 21021	Fuse Holder
48	4 2359 22130	RCA Pin Jack 2P
49	4 2359 22440	Socket Transistor
50	4 2359 22710	Socket 4P
51	4 2359 22730	Socket 1P
52	4 2369 20561	Plug 1P
53	4 2369 21220	Short Plug
54	4 2379 21460	Terminal, Antenna Connector
55	4 2379 21570	Terminal, Speakers Connector
56 *	4 2439 20521	Power Cord
57 (T-1)	4 2512 01510	Power Trans
58	4 2539 20430	Peaking Coil 10 µH (L01)
59	4 2579 25040	AM Antenna
60	4 2599 20300	Balun
61	4 5119 20671	Meter Signal Strength
62	4 5119 20681	Meter, Center of Channel
63	4 6129 20280	Pilot Lamp 6.3V 250mA
64	4 6129 20592	Small Lamp Indicator 5V 60mA
65	HLL-PTH487A-BE	Posistor Protector
66 (C02,03)	4 2239 20990	Capacitor Electrolytic 10000 µF 50V
C08	C1CRE-227A	Cap. Electrolytic 220 µF 16V
C09	C1EUEM475A	Cap. Alsicon 4.7 µF 25V ±20 %
C10	C1HYDZ 473A	Cap. Ceramic 0.047 µF 50V +80,–20%
C11,12	C1HFRM104A	Cap. Mylar 0.1 µF 50V ±20 %
67	DDD-S5VB20	Diode S5VB20 (Power Supply)
67-1 (C04,05 06,07)	C2HYDP103A	Cap. Ceramic 0.01 µF 500V +100, –0 %
68	DAA-STV-3H--W	Diode STV-3H (Idling Bias)
69 (Q01,02)	TNN-2SD287A-Q	TR 2SD287A-Q
70 (Q03,04)	TNN-2SB539A-Q	TR 2SB539A-Q
R03, 04	R3DXPK561A	Resistor Oxide Metal Film 560 ohm 2W ±10 %
R05,06	R2HXPK151A	Resistor Oxide Metal Film 150 ohm 1/2W ±10 %
R07,08	R2EDPJ274A	Resistor Solid 270K 1/4W ±5%
R09,10	R3DXPK561A	Resistor Oxide Metal Film 560ohm 2W ±10 %
R11,12	R2HXPK151A	Resistor Oxide Metal Film 150 ohm 1/2W ±10 %
R13,14	R3DXPK100A	Resistor Oxide Metal Film 10 ohm 2W ±10 %
R15	R2HCPK222A	Resistor Solid 2.2k ohm 1/2W ±10 %
71 (S-01)	4 2319 34150	Switch Rotary Function
72 (S-02)	4 2319 34130	Switch Rotary Tape Monitor
73 (S-09)	4 2319 34140	Switch Rotary Speaker
74 (S-10)	4 2312 00150	Switch Lever Power
74-1 (C13,14)	C2EHRM103A	Capacitor Polypropilene 0.01 µF 250V ±20 %
75 *	1310 4001 72700	AM, FM RF/IF MPX PC Assy
76 *	1310 4001 72802	Power AMP PC Assy
77 *	1310 4001 72900	Protector PC Assy
78 *	1310 4001 73002	Power Supply PC Assy
79 *	1310 4001 73101	EQ PC Assy
80 *	1310 4001 74900	Pre Tone PC Assy
81 *	1310 4001 72163	Dial Lamp PC Assy
82 (S-11)	4 2319 21531	Slide Switch, Volt Select
83	4 2359 20190	Din Socket

NOTE:* Asterisk indicates not a service part.

RECOMMENDED TEST EQUIPMENT

The following test equipment is recommended to completely test and align the Receiver.

- Line Voltage Isolation Transformer.
- AC DC Multimeter.
- Accurately Calibrated AC Voltmeter.
- Oscilloscope (Flat to 100 KHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Two (2) Load Resistors, 8-ohms, 250 Watts (Minimum Rating)
- Low-Distortion AM-FM Signal Generator
- 10.7 MHz Sweep Generator
- Multiplex Generator
- 455 KHz Sweep Generator

HARMONIC DISTORTION TEST

CAUTION: Limit the following tests to no more than ten minutes each. Use 8-ohm resistors with a minimum power rating of 250 watts when connecting a load across the SPEAKERS terminals.

CONTROL SETTINGS:

Unplug the AC power cord and set the front panel controls as follows;

BASS, MID, TREBLE, and BALANCE controls to center positions
POWER switch to OFF
SPEAKERS switch to PHONES
FUNCTION switch to AUX
HIGH & LOW,FILTER, MONO MODE, LOUDNESS CONTOUR and TAPE MONITOR switch to OFF and SOURCE
VOLUME control to MINIMUM position
LEFT CHANNEL DRIVEN

ONE CHANNEL DRIVEN:

1) Connect a low distortion audio generator to LEFT AUX IN jack. Set generator frequency to 1 KHz and output to minimum.
2) Connect an 8-ohm load resistor between SPEAKERS MAIN LEFT and COM terminals.
   Connect a Harmonic Distortion analyzer and an AC VTVM in parallel across the 8-ohm load.
3) Connect the AC power cord and set SPEAKERS switch to MAIN. Turn VOLUME control to MAX.
4) Increase generator output for
   RS-1056E 72W RMS (24V across the 8-ohm load)
   Harmonic Distortion Analyzer should measure 0.1% distortion or less.
5) Repeat steps 1 through 4 for RIGHT CHANNEL.

BOTH CHANNELS DRIVEN

Connect 8-ohm load resistors across LEFT and RIGHT MAIN SPEAKERS terminals. Push down "MONO" switch. Adjust generator output and "BALANCE" control for 72W at Left and Right Channels 24V across the 8-ohm loads.
Harmonic Distortion Analyzer should measure 0.1% distortion or less at each channel.

ADJUSTMENT OF THE POWER AMP. P.C. BOARD

BEFORE ADJUSTMENT

1. Disconnect the PRE OUT/MAIN IN connector.
2. After the power switch is turned ON, allow a few minutes marking adjustment, to be sure of the most stable operation.
3. Connect dummy load resistors (8 ohm) to the speaker terminals.
4. Use DC V.T.V.M. or Circuit Tester (input impedance: More than 50k ohm/V)

(A) IDLING CURRENT ADJUSTMENT
Adjust VR01 (VR02) for an idling current of 30mA, Measure the voltage at both sides of R65 (R66) resister (0.47 ohm) and Adjust VR01 (VR02) to indicate 14mV ±2mV.

Note: Polarity of Emitter of Q01 (Q02) is (+) Mid-Point is (−).

(B) a. Turn the semi-fixed variable resistor slowly during adjustment.
b. Be careful of the polarity of each measurement point.

Nominal Specifications For Information Only.

RECEIVER		RS-1056E
POWER AMPLIFIER SECTION Continuous RMS sine wave power per channel within stated bandwidth at no more than stated distortion and with an 8 ohm load.		72W
Power Bandwidth		20Hz/20kHz
Total Harmonic Distortion		0.1 %
PREAMPLIFIER SECTION Input Sensitivity and Impedance At rated output, 8-ohms at 1kHz Phono (1 and 2)		2mV/ 50k ohm
Phono (max input capability)		180mV
Auxiliary		150mV/100k ohm
Tape Monitor (1 and 2)		150mV/100k ohm
Hum & Noise (below rated output) Phono (1 and 2)		76 dB
Auxiliary		90 dB
Tape Monitor (1 and 2)		90 dB
Frequency Response Phono (RIAA EQUALIZED ±2 dB)		30Hz - 15kHz
Auxiliary input±2 dB		20Hz - 20kHz
Tape Monitor input ±2 dB		20Hz - 20kHz
Bass Control Range (at 100Hz)		±10 dB
Treble Control Range (at 10kHz)		±10 dB
Mid Range (at 1.5kHz)		±10 dB
Loudness Contour (at 30 dB volume attenuation)		+8 dB at 100Hz +4 dB at 10kHz
High Filter		–6 dB (5kHz)
Low Filter		–6 dB (60Hz)
Separation (Stereo) @ 1kHz		40 dB
POWER SECTION INPUT		150mV/100k ohm
FM TUNER SECTION Usable Sensitivity	Mono	1.7 μV/ 9.8 dBf
	Stereo	4.3 μV/17.9 dBf
50 dB Quieting Sensitivity	Mono	2.5 μV/13.2 dBf
	Stereo	34 μV/ 35.9 dBf
Capture Ratio		0.8 dB
Alt Channel Selectivity		75 dB
Image Response Rejection		80 dB
Spurious Response Rejection		100 dB
AM Rejection		65 dB
Signal-to-Noise Ratio (Mono & Stereo)		75/70 dB
Total Harm. Distortion (Mono & Stereo)		0.15/ 0.25 %
50 dB Quieting Sensitivity THD	Mono	0.3 %
	Stereo	0.4 %
Stereo Separation (1 kHz/10 kHz)		45/36 dB
Sub-Carrier Suppression (19/38 kHz)		60/70 dB
AM TUNER SECTION Sensitivity		300 μV/m
Selectivity		43 dB
Signal-to-Noise Ratio		55 dB
Image Frequency Rejection		56 dB
IF Rejection		70 dB
GENERAL SECTION Power Requirements		110V/220V (50Hz)
Power Consumption		280VA
Dimensions H x W x D		52.6 x 17.5 x 36 cm
Weight		16 Kg

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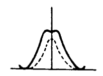
AM-FM MULTIPLEX ALIGNMENT

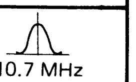
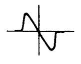
AM ALIGNMENT

For Alignment: Maintain generator output as low as possible for suitable indication.

Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output			
1	IF	Connect 455 kHz sweep generator to VC 4.	Connect oscilloscope to test point Pin No.8	Near max. capacity of VC at position of on interference	AM 1st 9-21310 AM DET 9-21291	 455 kHz
2	RF	Connect AM generator to EXT AM ANT and GND terminals. Set to 600 kHz. Modulate with 30 %, 1 kHz.	Connect oscilloscope and AC. V.T.V.M. to Record output	600 kHz	AM ANT 9-25040 AM OSC 9-20880	Max.
3		Change frequency to 1400 kHz.		1400 kHz	TC5 TC6	Max.
4	Repeat adjustments.					

1. Variable capacitor completely closed
2. Set the dial pointer to very left line dial scale.
3. Connect sweep generator, SG,V.T.V.M. and oscilloscope.
4. Function switch to "AM"
5. Use a screwdriver with plastic grip for all adjustment.

FM ALIGNMENT

Step	Adjusting circuit	Connection		Position of Tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output			
1	IF	Connect sweep 10.7 MHz generator to test point VC 3 through 0.01 μF.	Connect oscilloscope to test point TP 7. IC 02 Pin No.13	Near max. capacity of VC.at position of on Interference	FM IFT In FRONT END	 10.7 MHz
2	Quadrature Detector		Connect oscilloscope to test point TP1.		FM QUADRA TURE COIL 9-21320	
3	RF	Connect FM RF generator through two 120-ohm resistors to FM ANT screw terminals. Set generator to 90 MHz, modulate with 400 Hz to provide ±75 kHz deviation. Set generator output attenuator as low as possible.	Connect V.T.V.M. to Record output	90 MHz	LA LR	Max.
4		Change generator setting to 106 MHz.	Connect V.T.V.M. to Record output.	106 MHz	TCA TCR	Max.
5	Repeat adjustments.					

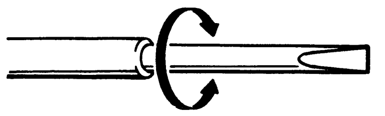
1. Variable capacitor compeltely closed
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG, V.T.V.M. and oscilloscope. FM ANT input impedance is 300 ohm.
4. Function switch to "FM"
5. Use a screwdriver with plastic grip for all adjustments.

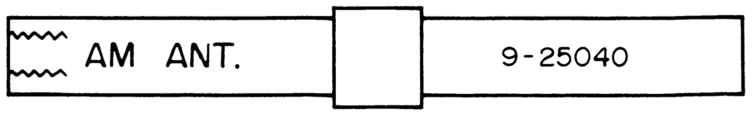
FM MPX ALIGNMENT

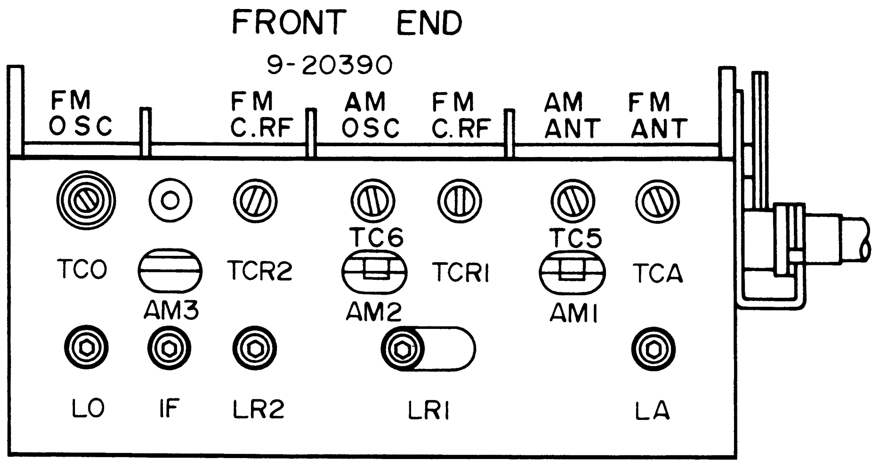
Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	
		Input	Output			
1	PLL IC FO (19 kHz) Adjustment	None	Connect Frequency counter or synchroscope to TP2.	Near max. capacity of VC. at position of on interference	Adjust VR03 (4.7k-B) so that frequency counter or synchroscope indicate 19 kHz	
2	FM STEREO Signal Separation	As above Steps 3,4 except modulation Modulate LEFT channel ±67.5 kHz – 400 Hz audio and ±7.5 kHz – 19 kHz pilot carrier. As above except modulate RIGHT Channel.	Connect V.T.V.M. to output terminal (R channel). Connect V.T.V.M. to output terminal (L channel).		VR 02 (1k-B)	V.T.V.M. Min.
3	Repeat steps 1,2. Set at position with max. channel separation.					

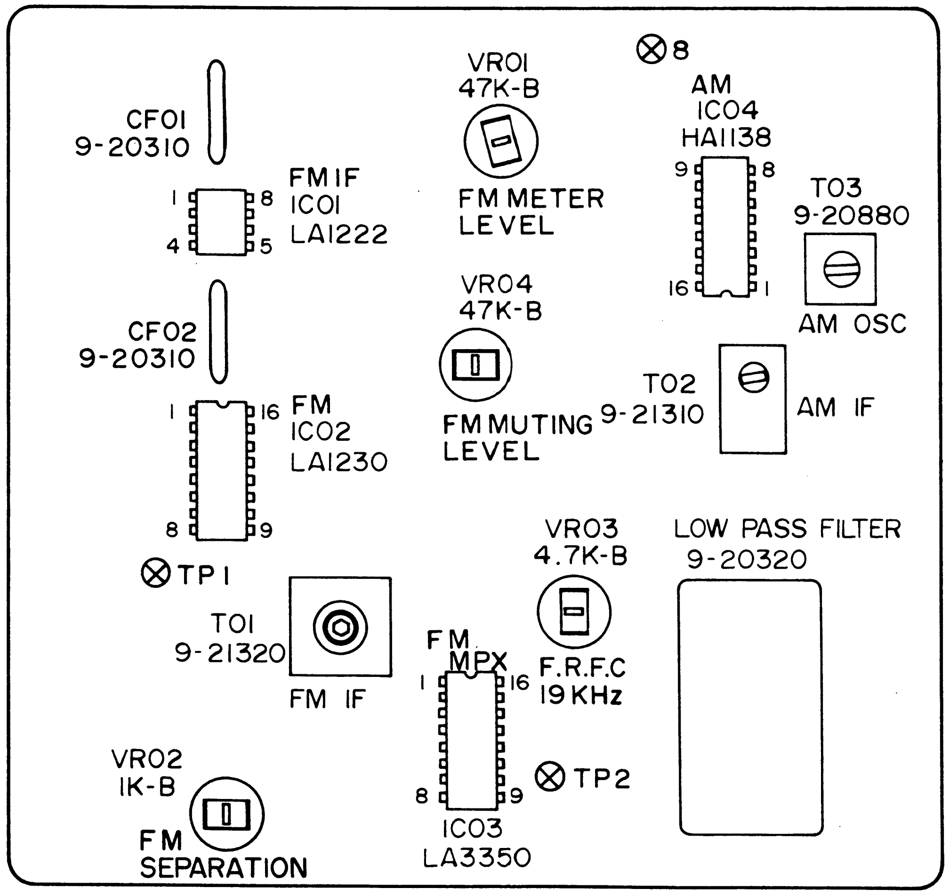
1. Variable capacitor completely closed
2. Connect FM stereo SG and V.T.V.M.
3. Function switch to "FM"
4. Use a screwdriver with plastic grip for all adjustments.

AM-FM RF/IF MPX BOARD LAYOUT




AM ANT.
9-25040

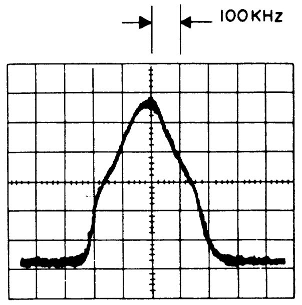

FRONT END
9-20390
FM OSC
FM C.RF
AM OSC
FM C.RF
AM ANT
FM ANT
TC6
TC5
TCO
TCR2
TCRI
TCA
AM3
AM2
AMI
LO
IF
LR2
LRI
LA


VR01
47K-B
FM METER LEVEL
⊗8
AM
IC04
HA1138
CF01
9-20310
FM IF
IC01
LA1222
1
8
4
5
9
8
16
1
T03
9-20880
AM OSC
VR04
47K-B
FM MUTING LEVEL
CF02
9-20310
T02
9-21310
AM IF
FM
IC02
LA1230
1
16
8
9
⊗TP1
T01
9-21320
FM IF
VR03
4.7K-B
F.R.F.C
19 KHz
LOW PASS FILTER
9-20320
FM MPX
1
16
8
9
⊗TP2
IC03
LA3350
VR02
1K-B
FM SEPARATION

ALIGNMENT WAVE FORMS

WITH OSCILLOSCOPE TIME BASE SETTINGS

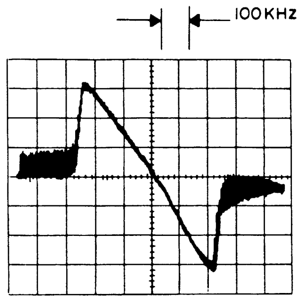
FM IF CURVE



Vertical Sensitivity: 0.5V/cm.
Horizontal Sweep: 100 usec./cm.

→ IF FREQ.
FM IF
ALIGNMENT

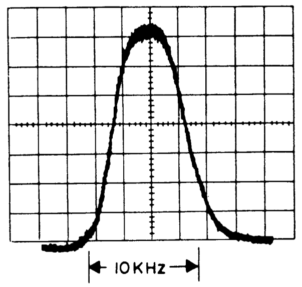
S-CURVE



Vertical Sensitivity: 0.5V/cm.
Horizontal Sweep: 100 usec./cm.

FM DETECTOR
ALIGNMENT

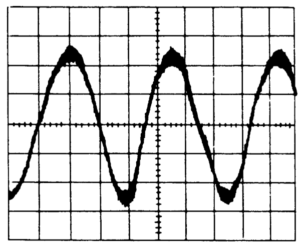
AM IF CURVE



Vertical Sensitivity: 0.5V/cm.
Horizontal Sweep: 100 usec./cm.

AM IF
ALIGNMENT

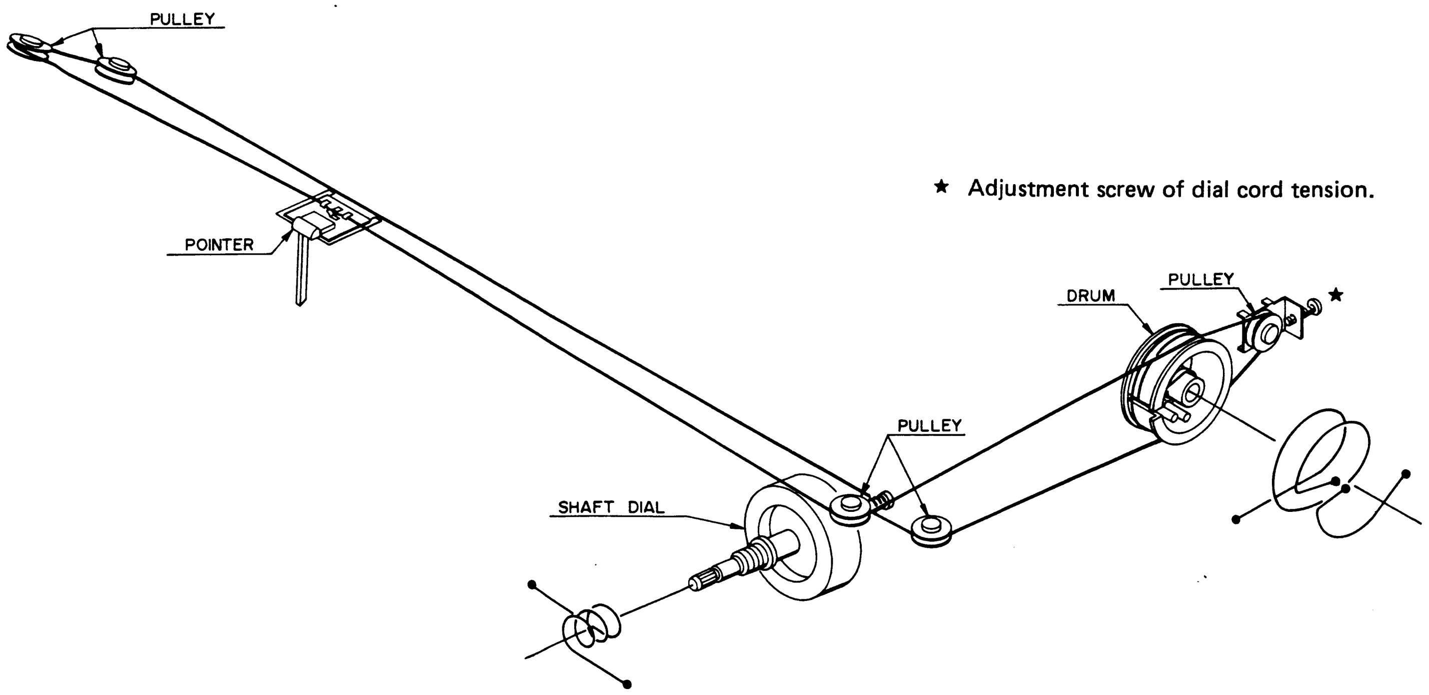
SINE WAVE



Vertical Sensitivity: 0.5V/cm.
Horizontal Sweep: 500 usec./cm.

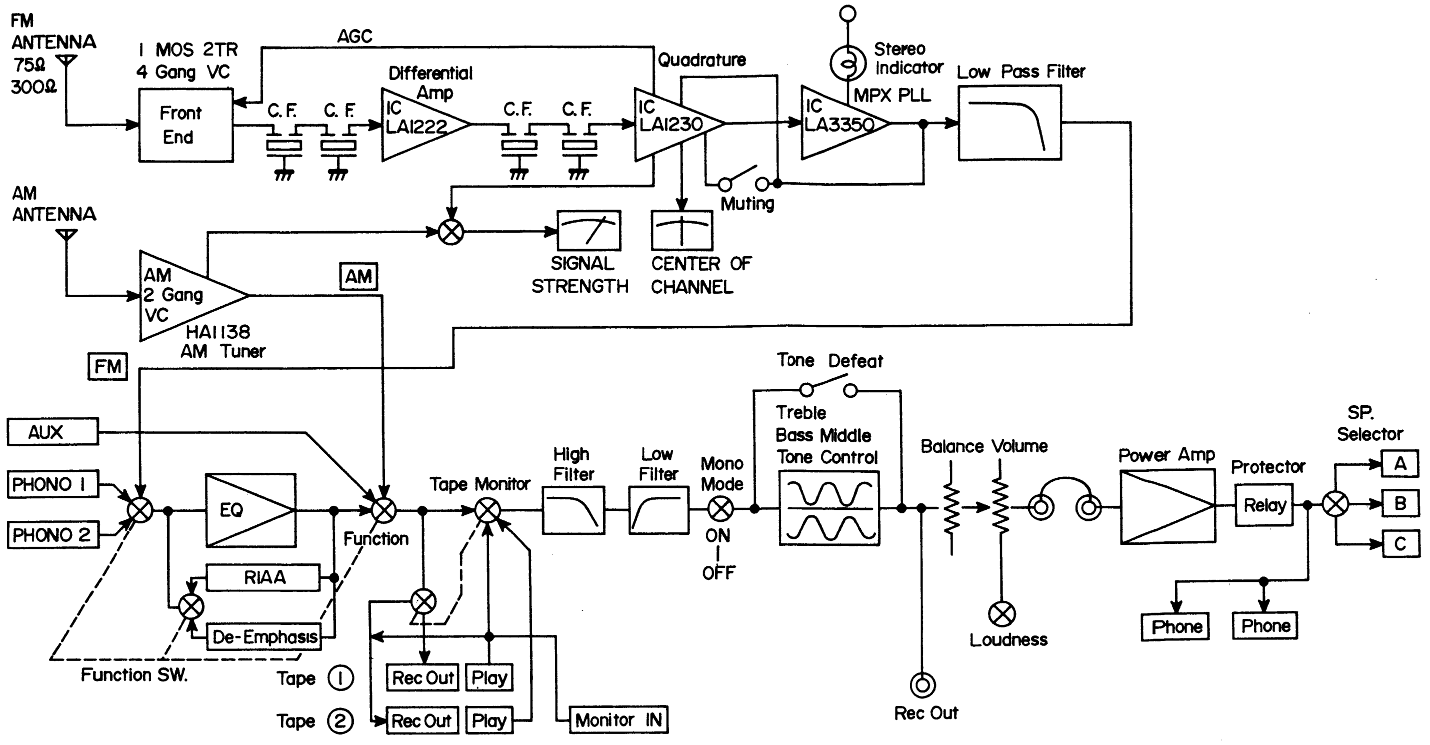
SYMMETRICAL
TUNING

DIAL CORD STRINGING

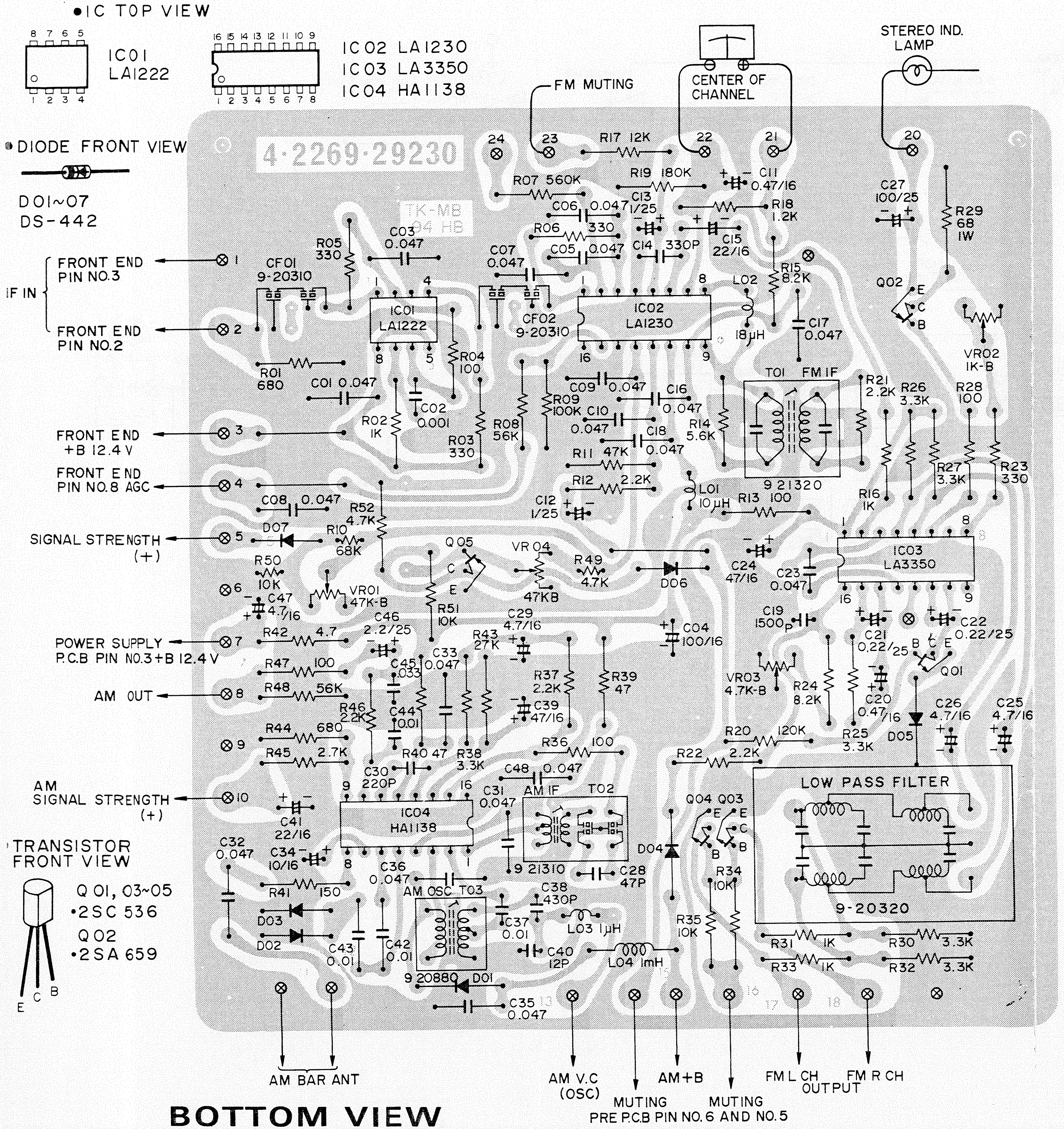

PULLEY
POINTER
DRUM
PULLEY
★
PULLEY
SHAFT DIAL

★ Adjustment screw of dial cord tension.

BLOCK DIAGRAM


FM ANTENNA 75Ω 300Ω
I MOS 2TR 4 Gang VC
Front End
AGC
C.F.
C.F.
Differential Amp
IC LA1222
C.F.
C.F.
IC LA1230
Quadrature
Stereo Indicator
MPX PLL
IC LA3350
Low Pass Filter
Muting
AM ANTENNA
AM 2 Gang VC
HA1138 AM Tuner
SIGNAL STRENGTH
CENTER OF CHANNEL
AM
FM
AUX
PHONO 1
PHONO 2
EQ
RIAA
De-Emphasis
Function SW.
Function
Tape Monitor
Tape ①
Tape ②
Rec Out
Play
Rec Out
Play
Monitor IN
High Filter
Low Filter
Mono Mode
ON
OFF
Tone Defeat
Treble Bass Middle Tone Control
Rec Out
Balance Volume
Loudness
Power Amp
Protector
Relay
Phone
Phone
SP. Selector
A
B
C

AM FM RF/IF MPX P.C.BOARD


●IC TOP VIEW
IC01 LA1222
IC02 LA1230
IC03 LA3350
IC04 HA1138
●DIODE FRONT VIEW
D01~07 DS-442
IF IN
FRONT END PIN NO.3
FRONT END PIN NO.2
FRONT END +B 12.4V
FRONT END PIN NO.8 AGC
SIGNAL STRENGTH (+)
POWER SUPPLY P.C.B PIN NO.3+B 12.4V
AM OUT
AM SIGNAL STRENGTH (+)
TRANSISTOR FRONT VIEW
Q01, 03~05 •2SC536
Q02 •2SA659
E C B
4-2269-29230
FM MUTING
CENTER OF CHANNEL
STEREO IND. LAMP
LOW PASS FILTER
9-20320
TO1 FM IF
9 21320
AM IF TO2
9 21310
AM OSC T03
9 20880
CF01 9-20310
CF02 9-20310
AM BAR ANT
AM V.C (OSC)
AM+B
FM L CH
FM R CH
OUTPUT
MUTING
MUTING
PRE P.C.B PIN NO.6 AND NO.5

BOTTOM VIEW

	PIN NUMBERS VOLTAGES															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC01 LA1222	1.39V	1.39V		11.5V	12.4V	1.35V	9.7V	12.4V								
IC02 LA1230	2.85V	2.85V	2.85V	0V	0V	5.92V	5.73V	5.75V	5.75V	5.75V	12.1V	3.38V	0.54V	0V	5.13V	0V
IC03 LA3350	10.7V	2.74V	4.71V	8.08V	8.11V	11.6V	0V	0.34V		0.56V	2.08V	2.25V	1.96V	2.09V	2.08V	2.85V
IC04 HA1138	11.7V	2.79V	11.7V	11.7V	4.9V	9.86V	2.0V	0.88V	0.06V	3.8V	4.3V	11.8V	2.76V	2.77V	2.72V	0V

PARTS LIST

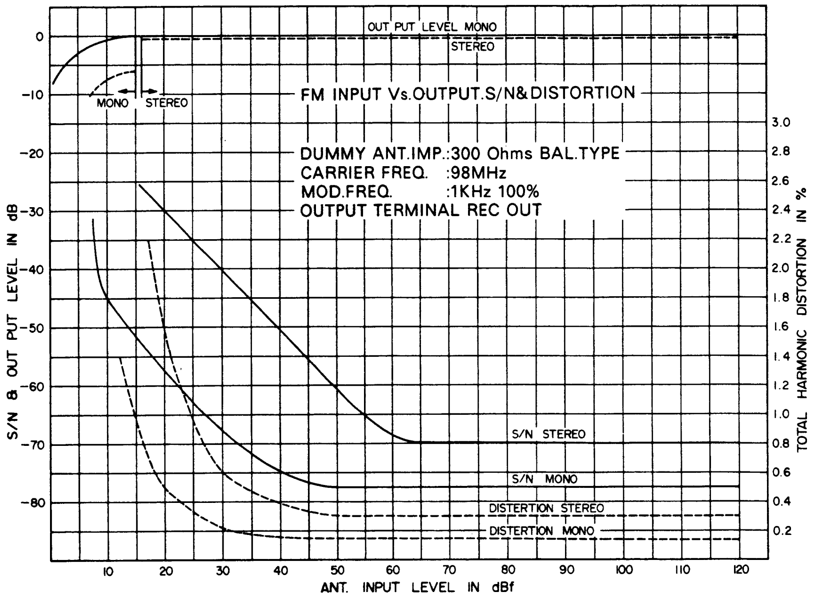
AM FM RF/IF MPX PCB Assy
1310 4001 72700

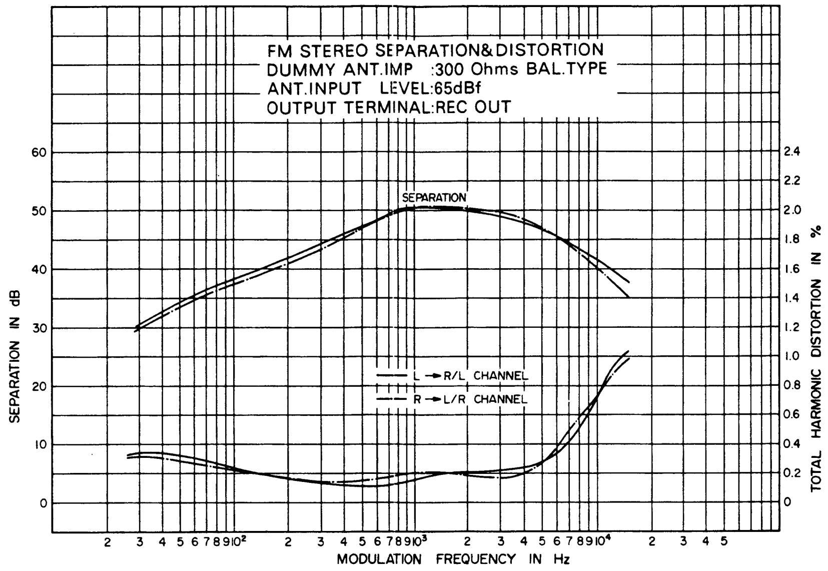
Ref. No.	Part Number	Description
L01	4 2539 20370	Coil 10 µH ±10 %
L02	4 2539 20380	Coil 18 µH ±5 %
L03	4 2539 20310	Coil 1 µH ±5 %
L04	4 2539 20170	Choke Coil 1 mH
T01	4 2569 21320	IF Trans FM
T02	4 2569 21310	IF Trans AM
T03	4 2589 20880	OSC Coil AM
VR01	4 2229 25100	Semi-Fixed VR 47k-B
VR02	4 2229 22910	VR 1k-B
VR03	4 2229 23880	VR 4.7k-B
VR04	4 2229 25100	Semi-Fixed VR 47k-B
	4 2279 20320	Low Pass Filter
	4 2359 23120	Socket 16P
CF01,02	4 2279 20310	Ceramic Filter
	CAPACITORS	
C01	C1HYSZ473A	Ceramic 0.047 µF 50V +80,–20 %
C02	C1HYSZ102A	Ceramic 0.001 µF 50V +80,–20 %
C03	C1HYSZ473A	Ceramic 0.047 µF 50V +80,–20 %
C04	C1CRB-107A	Electrolytic 100 µF 16V
C05,06 07,08 09,10	C1HYDZ473A	Ceramic 0.047 µF 50V +80,–20 %
C11	C1CUEX474A	Alsicon 0.47 µF 16V +40,–20 %
C12,13	C1EUEM105A	Alsicon 1 µF 25V ±20 %
C14	C1HCDK331SL	Ceramic 330pF 50V ±10 %
C15	C1CTRM226A	Tantalum 22 µF 16V ±20 %
C16,17 C18	C1HYDZ473A	Ceramic 0.047 µF 50V +80,–20 %
C19	C1HSEJ152A	Styrol 1500pF 50V ±5 %
C20	C1CUEX474A	Alsicon 0.47 µF 16V +40,–20 %
C21,22	C1EUEM224A	Alsicon 0.22 µF 25V ±20 %
C23	C1HFRM473A	Mylar 0.047 µF 50V ±20 %
C24	C1CRB-476A	Electrolytic 47 µF 16V
C25,26	C1CUEX475A	Alsicon 4.7 µF 16V +40,–20 %
C27	C1ERB-107A	Electrolytic 100 µF 25V
C28	C1HCSK470SL	Ceramic 47pF 50V ±10 %
C29	C1CRB-475A	Electrolytic 4.7 µF 16V
C30	C1HCDK221SL	Ceramic 220pF 50V ±10 %
C31,32 33	C1HYDZ473A	Ceramic 0.047 µF 50V +80,–20 %
C34	C1CRB-106A	Electrolytic 10 µF 16V
C35,36	C1HYDZ473A	Ceramic 0.047 µF 50V +80,–20 %
C37	C1HFRM103A	Mylar 0.01 µF 50V ±20 %
C38	C1HSEJ431A	Styrol 430pF 50V ±5 %
C39	C1CRB-476A	Electrolytic 47 µF 16V
C40	C1HCDJ120SL	Ceramic 12pF 50V
C41	C1CRB-226A	Electrolytic 22 µF 16V
C42,43	C1HYDZ103A	Ceramic 0.01 µF 50V +80,–20 %
C44	C1HFRM103A	Mylar 0.01 µF 50V ±20 %
C45	C1HFRM333A	Mylar 0.033 µF 50V ±20 %
C46	C1EUEM225A	Alsicon 2.2 µF 25V ±20 %
C47	C1CUEX475A	Alsicon 4.7 µF 16V +40,–20 %
C48	C1HYDZ473A	Ceramic 0.047 µF 50V +80,–20 %

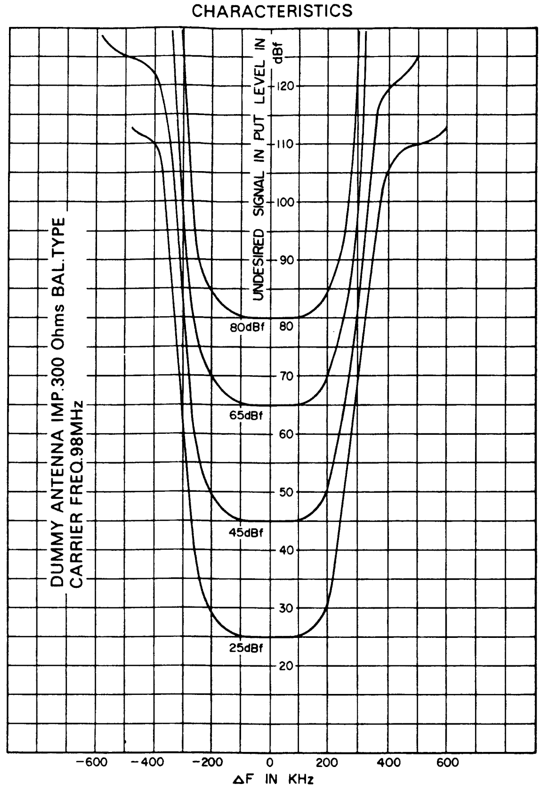
TRANSISTOR DC VOLTAGES				
SYMBOL NO.	DEVICE	B	C	E
Q01	2SC536	1.09V	0.56V	0.56V
Q02	2SA659	5.33V	5.36V	6.12V
Q03,04	2SC536	0V	0V	0V
Q05	2SC536	0.03V	3.78V	0V

Ref. No.	Part Number	Description		
	SEMICONDUCTORS			
D01,02 03,04 05,06 07	2055 9040 44210	Diode DS-442		
IC01	2065 0131 22210	IC LA1222		
IC02	2065 0151 23010	IC LA 1230		
IC03	2065 0743 35019	IC LA-3350SS		
IC04	IKK-HA1138	IC HA1138		
Q01	2035 5100 53640	TR 2SC536 D or E		
Q02	2035 6800 65940	TR 2SA659 D or E		
Q03,04 05	2035 5100 53640	TR 2SC536 D or E		
	RESISTORS			
R01	R2EDSJ681A	Carbon 680	1/4W	±5 %
R02	R2EDSJ102A	Carbon 1k	1/4W	±5 %
R03	R2EDSJ331A	Carbon 330	1/4W	±5 %
R04	R2EDSJ101A	Carbon 100	1/4W	±5 %
R05,06	R2EDSJ331A	Carbon 330	1/4W	±5 %
R07	R2EDSJ564A	Carbon 560k	1/4W	±5 %
R08	R2EDSJ563A	Carbon 56k	1/4W	±5 %
R09	R2EDSJ104A	Carbon 100k	1/4W	±5 %
R10	R2EDUJ683A	Carbon 68k	1/4W	±5 %
R11	R2EDSJ473A	Carbon 47k	1/4W	±5 %
R12	R2EDSJ222A	Carbon 2.2k	1/4W	±5 %
R13	R2EDSJ101A	Carbon 100	1/4W	±5 %
R14	R2EDSJ562A	Carbon 5.6k	1/4W	±5 %
R15	R2EDSJ822A	Carbon 8.2k	1/4W	±5 %
R16	R2EDSJ102A	Carbon 1k	1/4W	±5 %
R17	R2EDSJ123A	Carbon 12k	1/4W	±5 %
R18	R2EDSJ122A	Carbon 1.2k	1/4W	±5 %
R19	R2EDSJ184A	Carbon 180k	1/4W	±5 %
R20	R2EDSJ124A	Carbon 120k	1/4W	±5 %
R21,22	R2EDSJ222A	Carbon 2.2k	1/4W	±5 %
R23	R2EDSJ331A	Carbon 330	1/4W	±5 %
R24	R2EDSJ822A	Carbon 8.2k	1/4W	±5 %
R25,26 27	R2EDSJ332A	Carbon 3.3k	1/4W	±5 %
R28	R2EDSJ101A	Carbon 100	1/4W	±5 %
R29	R3AXBJ680A	Oxide Metal Film 68	1W	±5 %
R30	R2EDSJ332A	Carbon 3.3k	1/4W	±5 %
R31	R2EDSJ102A	Carbon 1k	1/4W	±5 %
R32	R2EDSJ332A	Carbon 3.3k	1/4W	±5 %
R33	R2EDSJ102A	Carbon 1k	1/4W	±5 %
R34,35	R2EDSJ103A	Carbon 10k	1/4W	±5 %
R36	R2EDSJ101A	Carbon 100	1/4W	±5 %
R37	R2EDSJ222A	Carbon 2.2k	1/4W	±5 %
R38	R2EDSJ332A	Carbon 3.3k	1/4W	±5 %
R39,40	R2EDSJ470A	Carbon 47	1/4W	±5 %
R41	R2EDSJ151A	Carbon 150	1/4W	±5 %
R42	R2EDSJ4R7A	Carbon 4.7	1/4W	±5 %
R43	R2EDSJ273A	Carbon 27k	1/4W	±5 %
R44	R2EDSJ681A	Carbon 680	1/4W	±5 %
R45	R2EDSJ272A	Carbon 2.7k	1/4W	±5 %
R46	R2EDSJ222A	Carbon 2.2k	1/4W	±5 %
R47	R2EDSJ101A	Carbon 100	1/4W	±5 %
R48	R2EDSJ563A	Carbon 56k	1/4W	±5 %
R49	R2EDUJ472A	Carbon 4.7k	1/4W	±5 %
R50	R2EDUJ103A	Carbon 10k	1/4W	±5 %
R51	R2EDSJ103A	Carbon 10k	1/4W	±5 %
R52	R2EDSJ472A	Carbon 4.7k	1/4W	±5 %

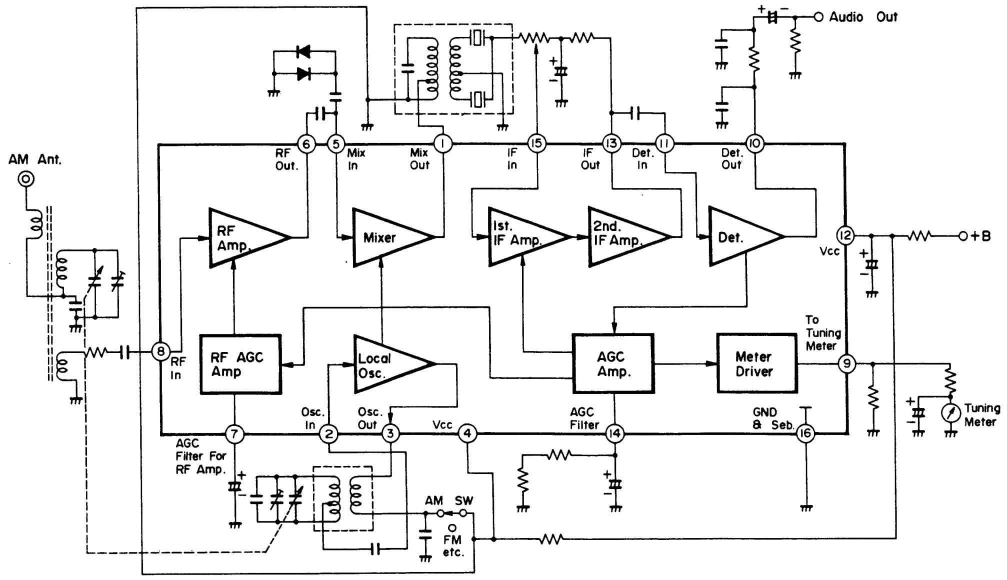
FM TUNER SECTION CHARACTERISTIC CURVE



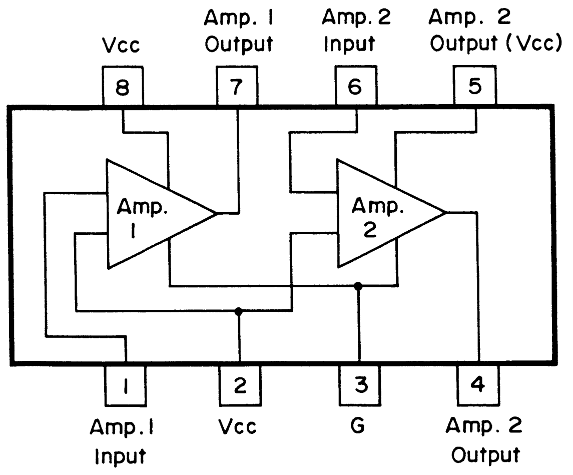


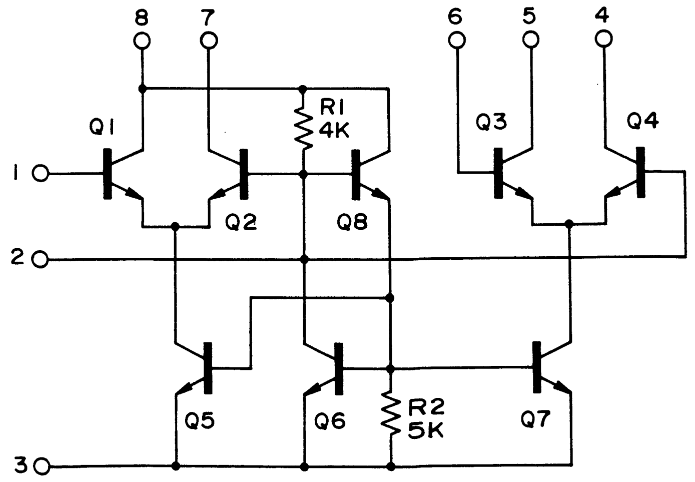


AM RF IF IC HA1138 SIGNAL FLOW


AM Ant.
Audio Out
RF Out.
Mix In
Mix Out
IF In
IF Out
Det. In
Det. Out
RF Amp.
Mixer
1st. IF Amp.
2nd. IF Amp.
Det.
Vcc
+B
RF AGC Amp
Local Osc.
AGC Amp.
Meter Driver
To Tuning Meter
Tuning Meter
RF In
AGC Filter For RF Amp.
Osc. In
Osc. Out
Vcc
AGC Filter
GND & Seb.
AM SW
FM etc.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

FM IF IC LA1222 SIGNAL FLOW AND EQUIVALENT DIAGRAM


Vcc
Amp. I Output
Amp. 2 Input
Amp. 2 Output (Vcc)
8
7
6
5
Amp. I
Amp. 2
1
2
3
4
Amp. I Input
Vcc
G
Amp. 2 Output


8
7
6
5
4
Q1
R1 4K
Q3
Q4
1
Q2
Q8
2
Q5
Q6
R2 5K
Q7
3

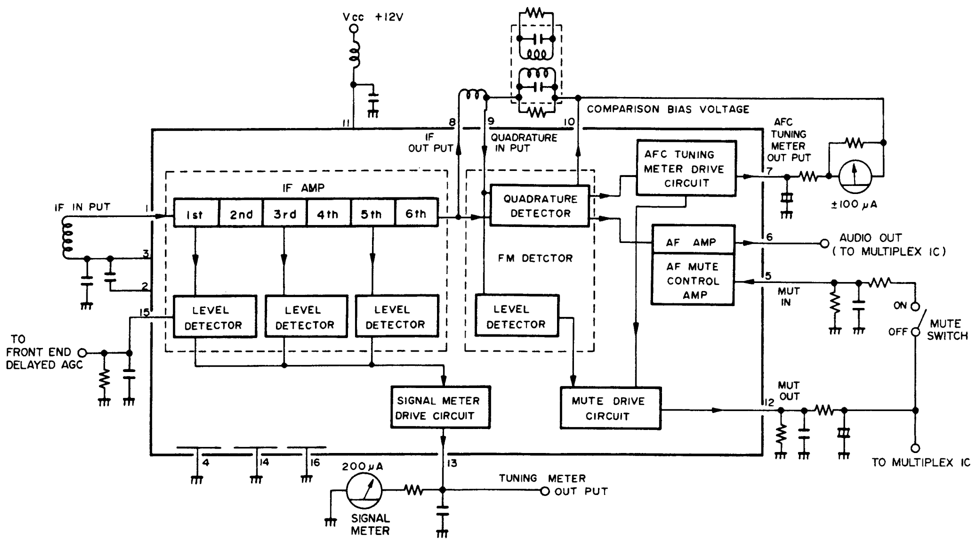
Signal enters R.F. AMP of I.C. where it is amplified. The converter section consists of a mixer and a local oscillator. The output of the mixer stage contains two frequency components.

The 455 KHz component signal is then fed to the I.F. amplifier. The tuned Frequency of the I.F. filter is 455 KHz. When the I.F. signal appears at the low pass filter, the 455-KHz carrier component is then locked, allowing only its audio component to pass.

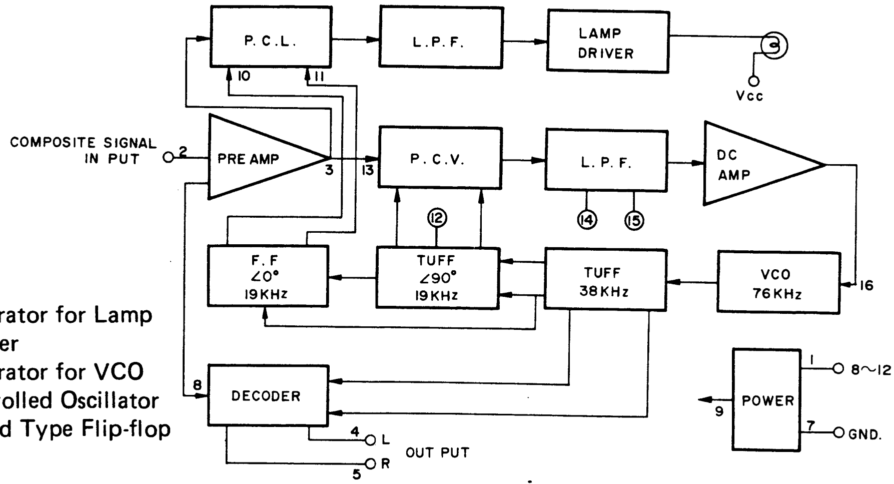
The circuit contains two steps of an independent differential amplification circuit, although the LA1222 is rated to operate on 12-volt power, it can also be used at low voltage, it also permits desired current limitation through insertion of a resistor between pins (2) and (8).

The limiting action by this circuit has current-limiting type limiter characteristics. The advantages that the current-limiting type limiter are: It improves capture ratio against input variation, it does not deviate center frequencis, etc...

FM IF IC LA1230 SIGNAL FLOW


Vcc +12V
COMPARISON BIAS VOLTAGE
IF OUT PUT
QUADRATURE IN PUT
AFC TUNING METER OUT PUT
AFC TUNING METER DRIVE CIRCUIT
±100 µA
IF IN PUT
IF AMP
1st
2nd
3rd
4th
5th
6th
QUADRATURE DETECTOR
FM DETCTOR
AF AMP
AUDIO OUT (TO MULTIPLEX IC)
AF MUTE CONTROL AMP
MUT IN
ON
OFF
MUTE SWITCH
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL DETECTOR
TO FRONT END DELAYED AGC
SIGNAL METER DRIVE CIRCUIT
MUTE DRIVE CIRCUIT
MUT OUT
TO MULTIPLEX IC
200 µA
SIGNAL METER
TUNING METER OUT PUT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

FM MPX IC LA3350 SIGNAL FLOW


P. C. L.
L. P. F.
LAMP DRIVER
Vcc
COMPOSITE SIGNAL IN PUT
PRE AMP
P. C. V.
L. P. F.
DC AMP
F. F ∠0° 19KHz
TUFF ∠90° 19KHz
TUFF 38KHz
VCO 76KHz
DECODER
POWER
8~12V
GND.
L
R
OUT PUT
2
3
4
5
7
8
9
10
11
12
13
14
15
16

P. C. L. : Phase Comparator for Lamp
L. P. F. : Low Pass Filter
P. C. V. : Phase Comparator for VCO
V C O : Voltage controlled Oscillator
TUFF : Direct coupled Type Flip-flop

The function of LA3350 is divided into two sections; the PLL section that reproduces the 38 KHz subcarrier, and the decoder section that switches the composite signal. The phase-duty cycle stability of the switching signal reproduced by the PLL determines the separation and the distortion factor of the demodulated signal. The phase comparator detects the phase difference between the VCO oscillator signal and the pilot signal. The detected output is in turn used as the control signal for the VCO.

Since higher harmonics are contained in this phase difference signal, it is necessary that a loop filter be used to eliminate these harmonics. The resulting DC component is applied to the VCO as the control signal. The characteristics of the loop filter practically determines the characteristics of the PLL. Stability of the signal synchronized to the input cannot be obtained unless the VCO itself is stable.

Here, only the demodulator circuit is essential as the FM stereo multiplex demodulator. The other components are the PLL as the 19 KHz selective circuit, and the stereo broadcast indicator circuit. The functions of these components are briefly described below.

The voltage controlled oscillator generates a saw-tooth wave of 76 KHz, and is frequency-controlled by the output from the DC amplifier. The frequency of the DC amplifier output is reduced to half, or 38 KHz, by means of a direct-coupled flip-flop circuit FF-1. This 38 KHz signal is applied to the demodulator circuit and demodulates the stereo composite signal. The FF-1 output is again reduced to 19 KHz by another direct-coupled flip-flop circuit FF-2.

This FF-2 output is then applied to a phase comparator, PC-1, and its phase is compared with that of the pilot signal contained in the input signal. The output from the FF-3 is 19 KHz and 90 degrees lagging in phase behind that of the FF-2 output. It is then applied to another phase comparator, PC-2, where the 19 KHz component of the input signal is detected and fed to the stereo broadcast indicator circuit ot activate the pilot lamp.

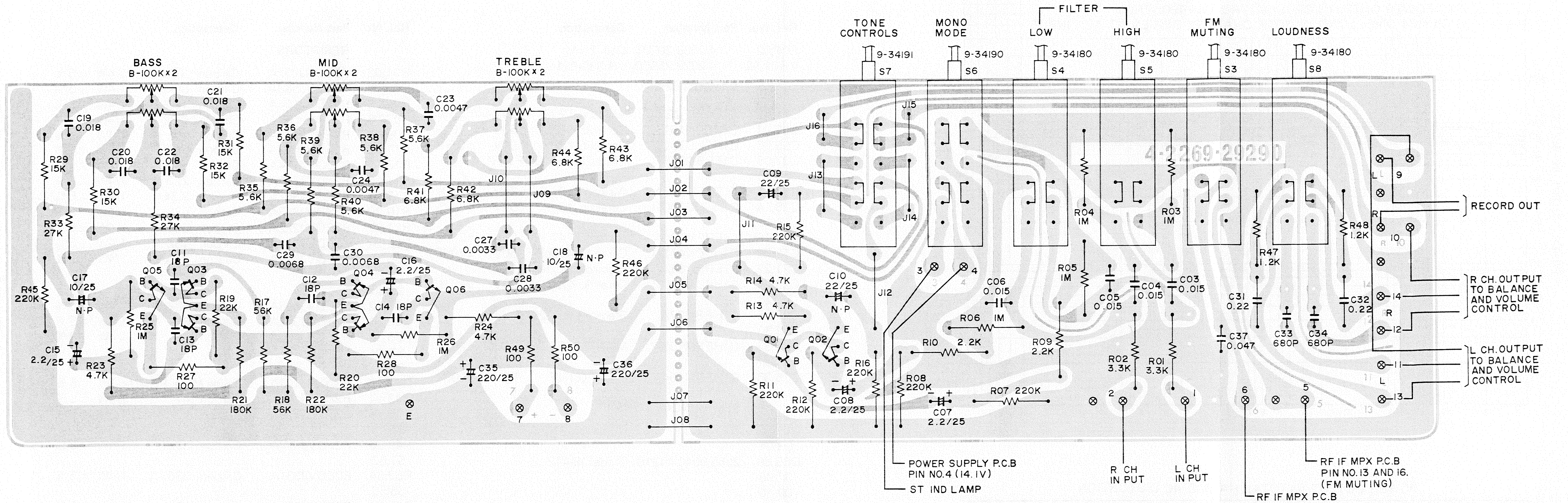
PARTS LIST

PRE TONE PCB Assy
1310 4001 74900

Ref. No.	Part Number	Description		
	4 2229 25390	VR B-100kx2		
S03	4 2319 34180	SW Lever FM Muting		
S04	4 2319 34180	SW Lever Low Filter		
S05	4 2319 34180	SW Lever High Filter		
S06	4 2319 34190	SW Lever Mono Mode		
S07	4 2319 34191	SW Lever Tone Controls		
S08	4 2319 34180	SW Lever Loudness		
	CAPACITORS			
C03,04 05,06	C1HFRK153A	Mylar 0.015 µF	50V	±10 %
C07,08	C1EUEM225A	Alsicon 2.2 µF	25V	±20 %
C09,10	C1EAEN226A	Electrolytic 22 µF	25V	±30 %
C11,12 13,14	C1HCDK180SL	Ceramic 18pF	50V	±10 %
C15,16	C1EUEM225A	Alsicon 2.2 µF	25V	±20 %
C17,18	C1EAEN106A	Electrolytic 10 µF	25V	±30 %
C19,20 21,22	C1HFRK183A	Mylar 0.018 µF	50V	±10 %
C23,24	C1HFRK472A	Mylar 0.0047 µF	50V	±10 %
C27,28	C1HFRK332A	Mylar 0.0033 µF	50V	±10 %
C29,30	C1HFRK682A	Mylar 0.0068 µF	50V	±10 %
C31,32	C1HFRK224A	Mylar 0.22 µF	50V	±10 %
C33,34	C1HYDK681R	Ceramic 680pF	50V	±10 %
C35,36	C1ERE-227A	Electrolytic 220 µF	25V	
C37	C1HYDZ473A	Ceramic 0.047 µF	50V	+80, –20 %

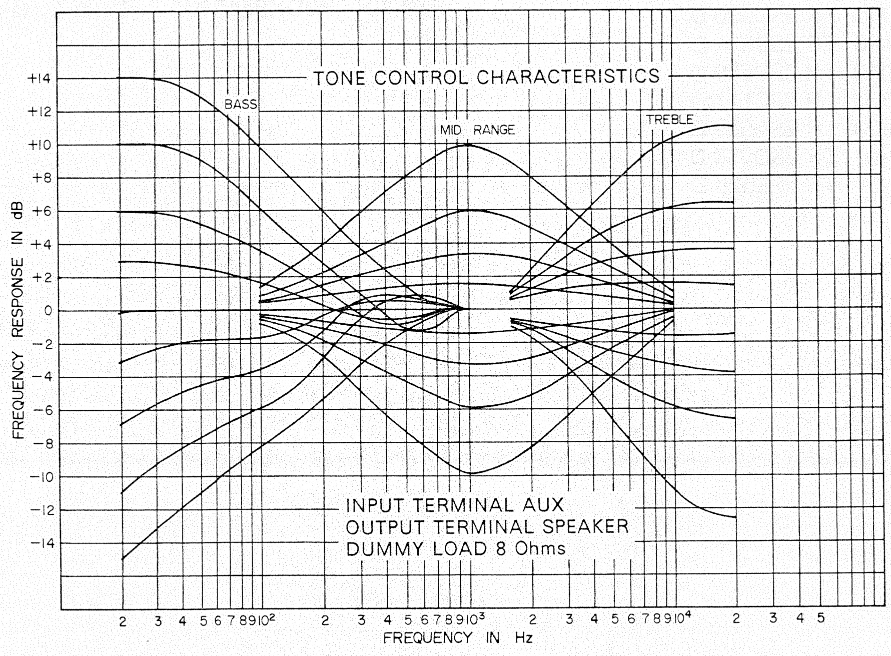
Ref. No.	Part Number	Description			
	SEMICONDUCTORS				
Q01,02 05,06	2035 5151 57079	TR 2SC1570 LG			
Q03,04	TMM-2SA798--F	TR 2SA798 F			
	RESISTORS				
R01,02	R2EDVJ332A	Carbon	3.3k	1/4W	±5 %
R03,04 05,06	R2EDVJ105A	Carbon	1M	1/4W	±5 %
R07,08	R2EDVJ224A	Carbon	220k	1/4W	±5 %
R09,10	R2EDVJ222A	Carbon	2.2k	1/W	±5 %
R11,12	R2EDVJ224A	Carbon	220k	1/4W	±5 %
R13,14	R2EDVJ472A	Carbon	4.7k	1/4W	±5 %
R15,16	R2EDVJ224A	Carbon	220k	1/4W	±5 %
R17,18	R2EDVJ563A	Carbon	56k	1/4W	±5 %
R19,20	R2EDVJ223A	Carbon	22k	1/4W	±5 %
R21,22	R2EDVJ184A	Carbon	180k	1/4W	±5 %
R23,24	R2EDVJ472A	Carbon	4.7k	1/4W	±5 %
R25,26	R2EDVJ105A	Carbon	1M	1/4W	±5 %
R27,28	R2EDVJ101A	Carbon	100	1/4W	±5 %
R29,30 31,32	R2EDVJ153A	Carbon	15k	1/4W	±5 %
R33,34	R2EDVJ273A	Carbon	27k	1/4W	±5 %
R35,36 37,38 39,40	R2EDVJ562A	Carbon	5.6K	1/4W	±5 %
R41,42 43,44	R2EDVJ682A	Carbon	6.8K	1/4W	±5 %
R45,46	R2EDVJ224A	Carbon	220K	1/4W	±5 %
R47,48	R2EDVJ122A	Carbon	1.2K	1/4W	±5 %
R49,50	R2EDVJ101A	Carbon	100	1/4W	±5 %

TONE CONTROL AND MODE SELECTOR P.C.BOARD


BASS
B-100K×2
MID
B-100K×2
TREBLE
B-100K×2
TONE CONTROLS
MONO MODE
FILTER
LOW
HIGH
FM MUTING
LOUDNESS
9-34191 S7
9-34190 S6
9-34180 S4
9-34180 S5
9-34180 S3
9-34180 S8
C19 0.018
C21 0.018
C20 0.018
C22 0.018
C23 0.0047
C24 0.0047
R29 15K
R30 15K
R31 15K
R32 15K
R33 27K
R34 27K
R35 5.6K
R36 5.6K
R39 5.6K
R38 5.6K
R37 5.6K
R40 5.6K
R41 6.8K
R42 6.8K
R44 6.8K
R43 6.8K
C27 0.0033
C28 0.0033
C29 0.0068
C30 0.0068
C18 10/25 N·P
R46 220K
C16 2.2/25
C11 18P
C12 18P
C13 18P
C14 18P
Q03
Q04
Q05
Q06
R45 220K
C17 10/25 N·P
C15 2.2/25
R23 4.7K
R25 IM
R19 22K
R17 56K
R27 100
R21 180K
R18 56K
R22 180K
R20 22K
R24 4.7K
R26 IM
R28 100
R49 100
R50 100
C35 220/25
C36 220/25
E
7
8
J01
J02
J03
J04
J05
J06
J07
J08
J09
J10
J11
J12
J13
J14
J15
J16
C09 22/25
R15 220K
R14 4.7K
R13 4.7K
C10 22/25 N·P
Q01
Q02
R16 220K
R11 220K
R12 220K
C08 2.2/25
R08 220K
C07 2.2/25
R07 220K
R10 2.2K
R06 IM
R05 IM
R04 IM
R03 IM
C06 0.015
C05 0.015
C04 0.015
C03 0.015
R09 2.2K
R02 3.3K
R01 3.3K
R47 1.2K
R48 1.2K
C31 0.22
C32 0.22
C37 0.047
C33 680P
C34 680P
4-2269-29290
1
2
3
4
5
6
9
10
11
12
13
14
L
R
RECORD OUT
R CH. OUTPUT TO BALANCE AND VOLUME CONTROL
L CH. OUTPUT TO BALANCE AND VOLUME CONTROL
POWER SUPPLY P.C.B PIN NO.4 (14.1V)
ST IND LAMP
R CH IN PUT
L CH IN PUT
RF IF MPX P.C.B PIN NO.13 AND 16. (FM MUTING)
RF IF MPX P.C.B PIN NO.14 (FM MUTING)

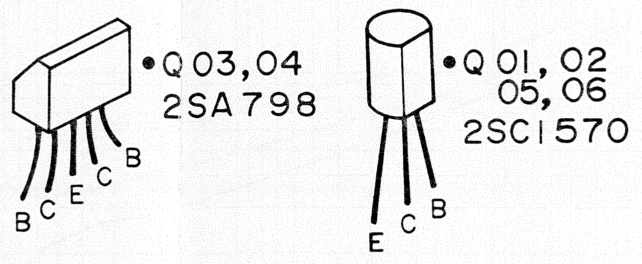
BOTTOM VIEW

CHARACTERISTIC CURVE

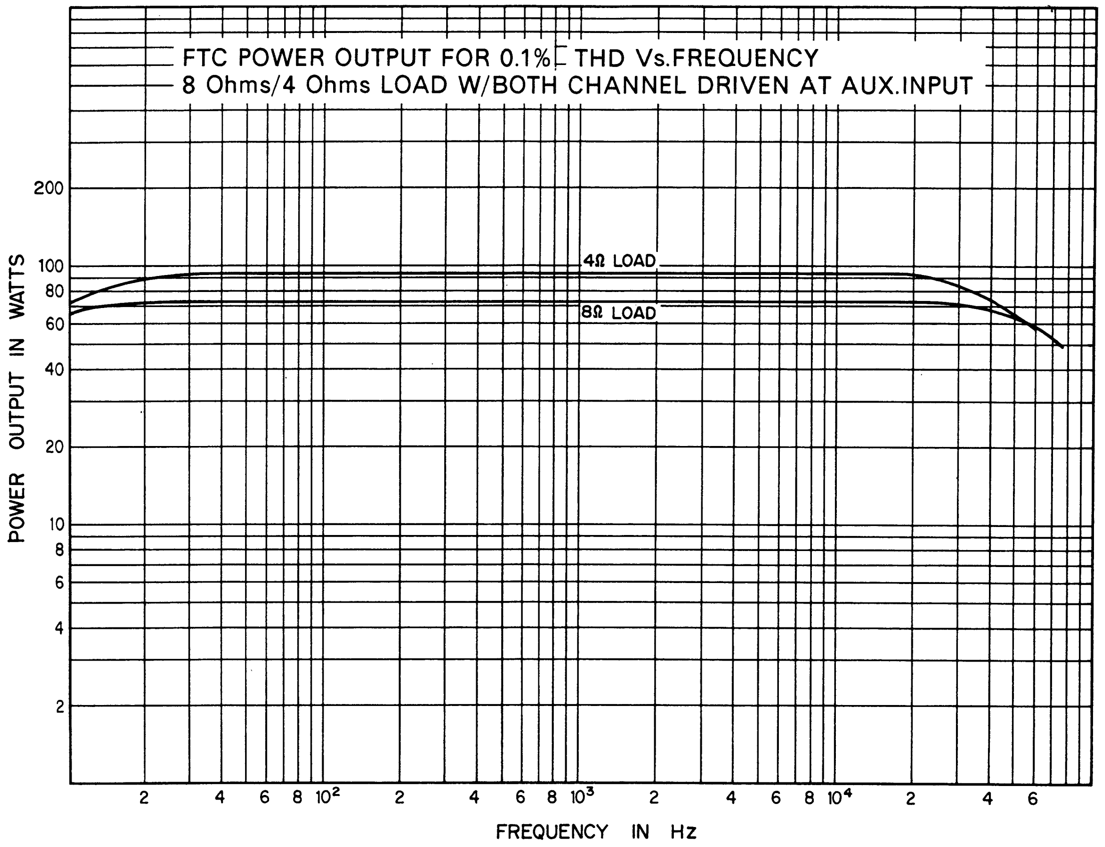


TRANSISTOR DC VOLTAGES						
SYMBOL NO.	DEVICE	B	C	E	C	B
Q01,02	2SC1570	−1.55V	19.6V	−22V		
Q03,04	2SA798	0.09V	−17.9V	0.07V	−18.9V	0.015V
Q05,06	2SC1570	−17.9V	−0.1V	−18.4V		

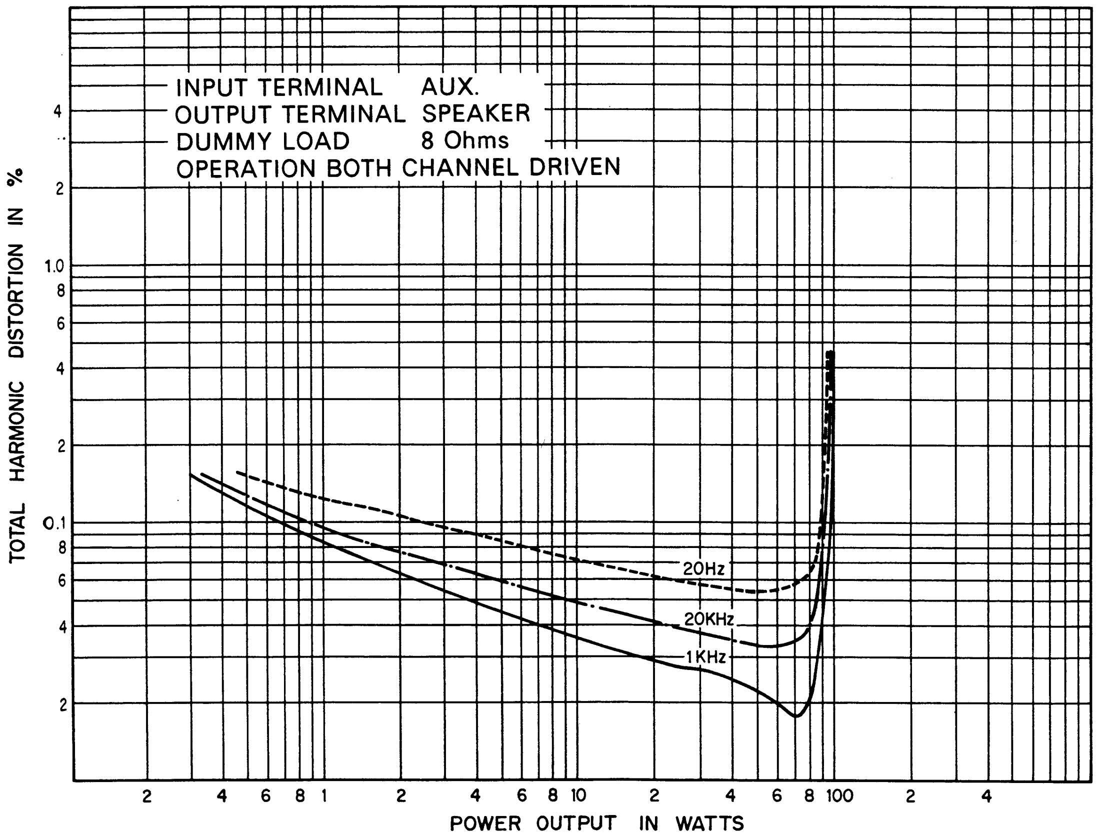
TRANSISTOR FRONT VIEW


•Q 03,04
2SA798
B C E C B
•Q 01, 02
05, 06
2SC1570
E C B

POWER AMPSECTION CHARACTERISTIC CURVE



POWER OUTPUT Vs.TOTAL HARMONIC DISTORTION



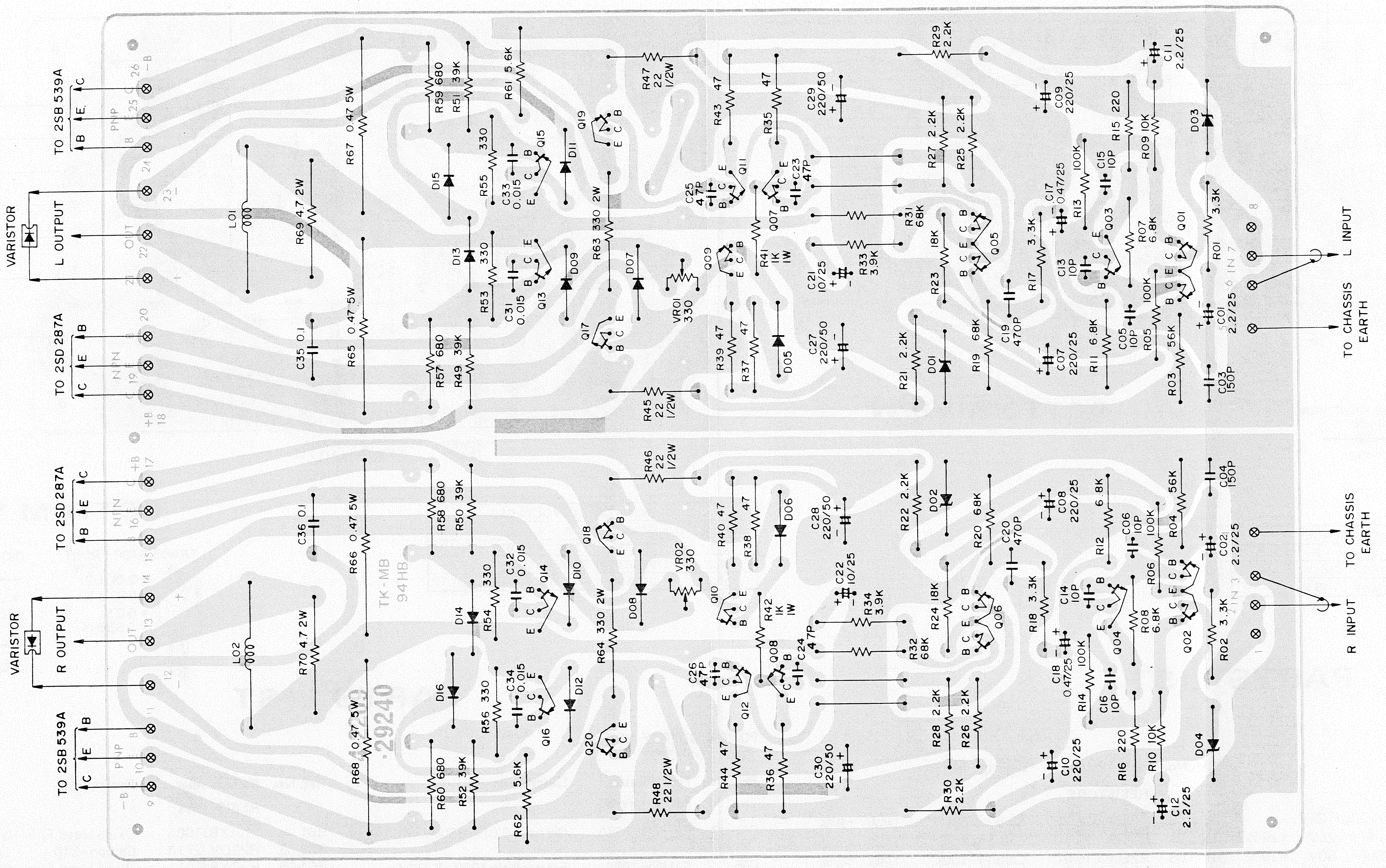
PARTS LIST

POWER AMP PCB Assy
1310 4001 72802

Ref. No.	Part Number	Description		
L01,02	4 2539 20281	Coil 2 μH		
VR01,02	4 2229 25500	VR 330-Bx1		
	CAPACITORS			
C01,02	C1EUEM 225A	Alsicon 2.2 μF	25V	± 20 %
C03,04	C1HCDK151SL	Ceramic 150pF	50V	± 10 %
C05,06	C1HCDD100SL	Ceramic 10pF	50V	± 0.5 %
C07,08	C1ERB-227A	Electrolytic 220 μF	25V	
09,10				
C11,12	C1EUEM225A	Alsicon 2.2 μF	25V	± 20 %
C13,14	C1HCDD100SL	Ceramic 10pF	50V	± 0.5 %
15,16				
C17,18	C1EUEM474A	Alsicon 0.47 μF	25V	± 20 %
C19,20	C1HCDK471SL	Ceramic 470pF	50V	± 10 %
C21,22	C1ERB-106A	Electrolytic 10 μF	25V	
C23,24	C1HCDK470SL	Ceramic 47pF	50V	± 10 %
25,26				
C27,28	C1HRB-227A	Electrolytic 220 μF	50V	
29,30				
C31,32	C1HFRM153A	Mylar 0.015 μF	50V	± 20 %
33,34				
C35,36	C1HFRM104A	Mylar 0.1 μF	50V	± 20 %
	SEMICONDUCTORS			
D01,02	DJJ-WZ-210	Diode WZ-210		
03,04				
D05,06	2055 9040 44210	Diode DS-442		
07,08				
09.10				
11,12				
13,14				
15,16				
Q01,02	TMM-2SA798--F	TR 2SA798 F		
Q03,04	2035 5151 57079	TR 2SA1570 LG		
Q05,06	TMM-2SA798--F	TR 2SA798 F		
Q07,08	2035 4900 60040	TR 2SD600 D		
Q09,10	2035 4910 63140	TR 2SB631 D		
Q11,12	2035 4900 60040	TR 2SD600 D		
Q13,14	2035 6701 17550	TR 2SC1175 E		
Q15,16	2035 6800 65950	TR 2SA659 E		
Q17,18	TMM-2SD358--D	TR 2SD358 D		
Q19,20	TMM-2SB528--D	TR 2SB528 D		

Ref. No.	Part Number	Description		
	RESISTORS			
R01,02	R2EDVJ332A	Carbon 3.3k	1/4W	± 5 %
R03,04	R2EDVJ563A	Carbon 56k	1/4W	± 5 %
R05,06	R2EDVJ104A	Carbon 100k	1/4W	± 5 %
R07,08	R2EDVJ682A	Carbon 6.8k	1/4W	± 5 %
R09,10	R2EDVJ103A	Carbon 10k	1/4W	± 5 %
R11,12	R2EDVJ682A	Carbon 6.8k	1/4W	± 5 %
R13,14	R2EDVJ104A	Carbon 100k	1/4W	± 5 %
R15,16	R2EDVJ221A	Carbon 220	1/4W	± 5 %
R17,18	R2EDVJ332A	Carbon 3.3k	1/4W	± 5 %
R19,20	R2EDVJ683A	Carbon 68k	1/4W	± 5 %
R21,22	R2EDVJ222A	Carbon 2.2k	1/4W	± 5 %
R23,24	R2EDVJ183A	Carbon 18k	1/4W	± 5 %
R25,26	R2EDVJ222A	Carbon 2.2k	1/4W	± 5 %
27,28				
29,30				
R31,32	R2EDVJ683A	Carbon 68k	1/4W	± 5 %
R33,34	R2EDVJ392A	Carbon 3.9k	1/4W	± 5 %
R35,36	R2EDVJ470A	Carbon 47	1/4W	± 5 %
37,38				
39,40				
R41,42	R3AXBJ102A	Oxide Metal Film 1k	1W	± 5 %
R43,44	R2EDVJ470A	Carbon 47	1/4W	± 5 %
R45,46	R2HZPK220A	Fuse 22	1/2W	±10 %
47,48				
R49,50	R2EDVJ393A	Carbon 39k	1/4W	± 5 %
51,52				
R53,54	R2EDVJ331A	Carbon 330	1/4W	± 5 %
55,56				
R57,58	R2EDVJ681A	Carbon 680	1/4W	± 5 %
59,60				
R61,62	R2EDVJ562A	Carbon 5.6k	1/4W	± 5 %
R63,64	R3DXBJ331A	Oxide Metal Film 330	2W	± 5 %
R65,66	R3HEPKR47A	Cement 0.47	5W	± 10 %
67,68				
R69,70	R3DXBJ4R7A	Oxide Metal Film 4.7	2W	± 5 %

POWER AMP P.C.BOARD

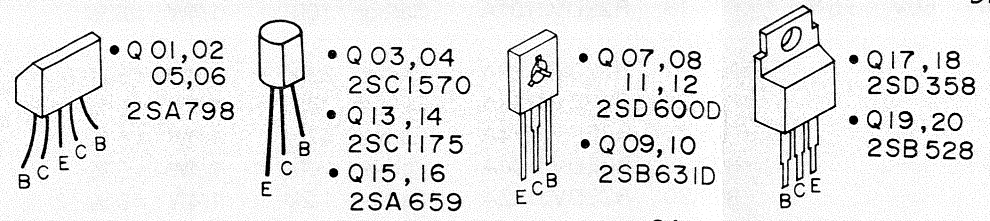

TO 2SB 539A
B E C
PNP
VARISTOR
L OUTPUT
TO 2SD 287A
C E B
NPN
+B
TO 2SD 287A
B E C
VARISTOR
R OUTPUT
TO 2SB 539A
C E B
L01
L02
R67 0.47 5W
R65 0.47 5W
R66 0.47 5W
R68 0.47 5W
R69 4.7 2W
R70 4.7 2W
C35 0.1
C36 0.1
R59 680
R51 39K
R57 680
R49 39K
R58 680
R50 39K
R60 680
R52 39K
R61 5.6K
R62 5.6K
R55 330
R53 330
R54 330
R56 330
C33 0.015
C31 0.015
C32 0.015
C34 0.015
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
D09
D10
D11
D12
D13
D14
D15
D16
R63 330 2W
R64 330 2W
D07
D08
R47 22 1/2W
R45 22 1/2W
R46 22 1/2W
R48 22 1/2W
VR01 330
VR02 330
Q09
Q10
Q11
Q12
Q07
Q08
R43 47
R35 47
R39 47
R37 47
R40 47
R38 47
R44 47
R36 47
C25 47P
C23 47P
C26 47P
C24 47P
R41 1K 1W
R42 1K 1W
C29 220/50
C27 220/50
C28 220/50
C30 220/50
C21 10/25
C22 10/25
D05
D06
R33 3.9K
R34 3.9K
R31 68K
R32 68K
R29 2.2K
R27 2.2K
R25 2.2K
R21 2.2K
R22 2.2K
R28 2.2K
R26 2.2K
R30 2.2K
R23 18K
R24 18K
Q05
Q06
D01
D02
R19 68K
R20 68K
C19 470P
C20 470P
R17 3.3K
R18 3.3K
C13 10P
C14 10P
C15 10P
C16 10P
C17 0.47/25
C18 0.47/25
R13 100K
R14 100K
C09 220/25
C07 220/25
C08 220/25
C10 220/25
R11 6.8K
R12 6.8K
C05 10P
C06 10P
R05 100K
R06 100K
Q03
Q04
Q01
Q02
R15 220
R16 220
R09 10K
R10 10K
R07 6.8K
R08 6.8K
R03 56K
R04 56K
C01 2.2/25
C02 2.2/25
C11 2.2/25
C12 2.2/25
C03 150P
C04 150P
R01 3.3K
R02 3.3K
D03
D04
L INPUT
TO CHASSIS EARTH
TO CHASSIS EARTH
R INPUT
TK-MB
94HB

TRANSISTOR DC VOLTAGES

SYMBOL NO.	DEVICE	B	C	E	C	B
Q01,02	2SA798	0.012V	20.5V	0.59V	21.8V	0.01V
Q03,04	2SC1570	20.5V	−0.03V	21.1V		
Q05,06	2SA798	0.088V	45.1V	0.688V	44.9V	0.078V
Q07,08	2SD600	44.9V	33.8V	45.5V		
Q09,10	2SB631	44.8V	1.18V	45.4V		

SYMBOL NO.	DEVICE	B	C	E
Q11,12	2SD600	−44.7V	−1.12V	–
Q13,14	2SC1175	0.3V	1.08V	0.02V
Q15,16	2SA659	0.25V	0.9V	0.02V
Q17,18	2SD358	1.18V	47.0V	0.613V
Q19,20	2SB528	−1.21V	47.0V	−0.58V

TRANSISTOR FRONT VIEW

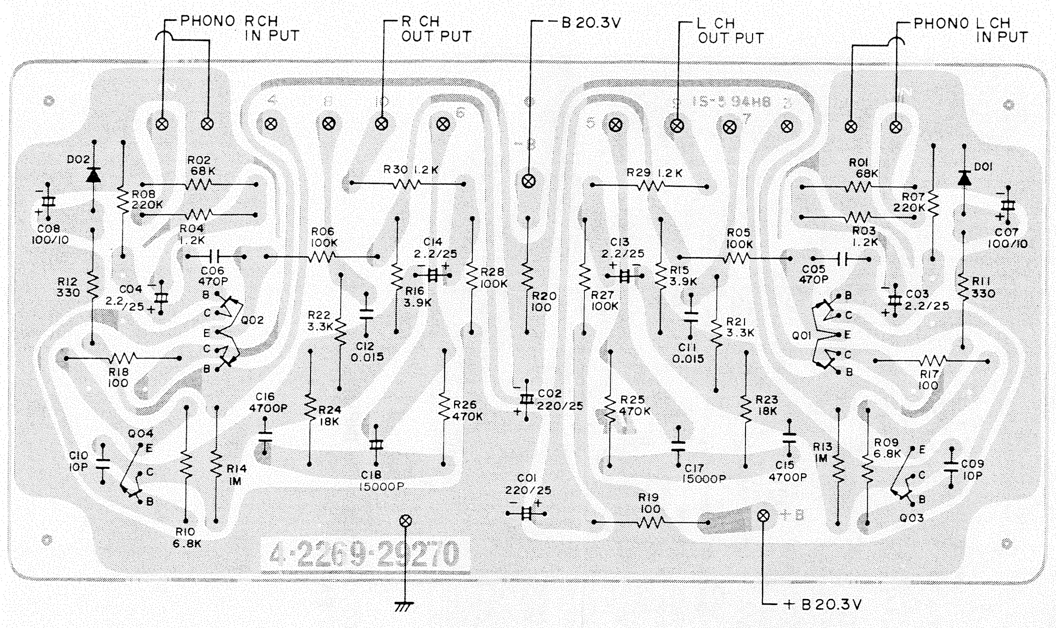

• Q01,02 05,06 2SA798
B C E C B
• Q03,04 2SC1570
• Q13,14 2SC1175
• Q15,16 2SA659
E C B
• Q07,08 11,12 2SD600D
• Q09,10 2SB631D
E C B
• Q17,18 2SD358
• Q19,20 2SB528
B C E

BOTTOM VIEW

DIODE FRONT VIEW

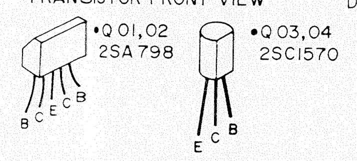
- D01~04 WZ 210
- D05~16 DS-442

EQ P.C.BOARD

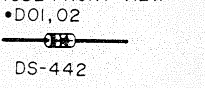

PHONO R CH IN PUT
R CH OUT PUT
−B 20.3V
L CH OUT PUT
PHONO L CH IN PUT
+B 20.3V
+B
4-2269-29270
IS-5 94H8
D02
D01
R02 68K
R08 220K
R04 1.2K
R01 68K
R07 220K
R03 1.2K
R30 1.2K
R29 1.2K
C08 100/10
C07 100/10
R12 330
R11 330
C04 2.2/25
C03 2.2/25
C06 470P
C05 470P
R06 100K
R05 100K
C14 2.2/25
C13 2.2/25
R16 3.9K
R15 3.9K
R28 100K
R27 100K
R20 100
R22 3.3K
R21 3.3K
C12 0.015
C11 0.015
Q02
Q01
R18 100
R17 100
C16 4700P
C15 4700P
R24 18K
R23 18K
R26 470K
R25 470K
C02 220/25
C01 220/25
Q04
Q03
C10 10P
C09 10P
R14 1M
R13 1M
C18 15000P
C17 15000P
R19 100
R10 6.8K
R09 6.8K

BOTTOM VIEW

TRANSISTOR FRONT VIEW


•Q 01,02
2SA798
B C E C B
•Q 03,04
2SC1570
E C B

DIODE FRONT VIEW


•D01,02
DS-442

TRANSISTOR DC VOLTAGES						
SYMBOL NO.	DEVICE	B	C	E	C	B
Q01 ,02	2SA798	0.45V	−18.7V	0.61V	−19.3V	0.05V
Q03 ,04	2SC1570	−18.7V	−0.04V	−18.8V		

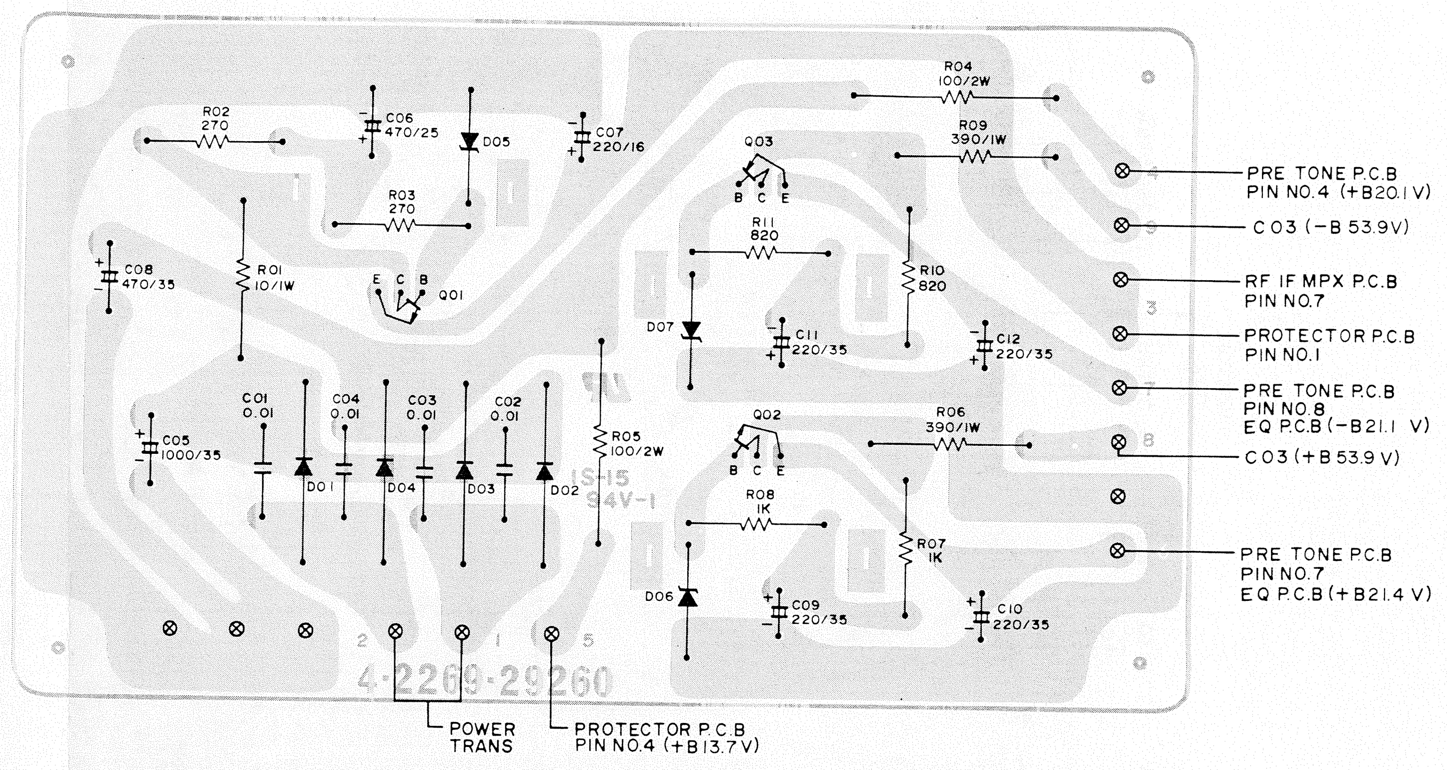
PARTS LIST

EQ PCB Assy
1310 4001 73101

Ref. No.	Part Number	Description		
	CAPACITORS			
C01,02	C1ERE-227A	Electrolytic 220 μF 25V		
C03,04	C1EUEM225A	Alsicon 2.2 μF	25V	±20 %
C05,06	C1HCDK471SL	Ceramic 470pF	50V	±10 %
C07,08	C1ARE-107A	Electrolytic 100 μF 10V		
C09,10	C1HCSD100SL	Ceramic 10pF	50V	±0.5 %
C11,12	C1HFRM153A	Mylar 0.015 μF	50V	±20 %
C13,14	C1EUEM225A	Alsicon 2.2 μF	25V	±20 %
C15,16	C1HSEJ472A	Styrol 4700pF	50V	±5 %
C17,18	C1HSEJ153A	Styrol 15000pF	50V	±5 %
	SEMICONDUCTORS			
D01,02	2055 9040 44210	Diode DS-442		
Q01,02	TMM-2SA798--F	TR 2SA798 F		
Q03,04	2035 5151 57079	TR 2SC1570 LG		

Ref. No.	Part Number	Description		
	RESISTORS			
R01,02	R2EDVJ683A	Carbon 68k	1/4W	±5 %
R03,04	R2EDVJ122A	Carbon 1.2k	1/4W	±5 %
R05,06	R2EDVJ104A	Carbon 100k	1/4W	±5 %
R07,08	R2EDVJ224A	Carbon 220k	1/4W	±5 %
R09,10	R2EDVJ682A	Carbon 6.8k	1/4W	±5 %
R11,12	R2EDVJ331A	Carbon 330	1/4W	±5 %
R13,14	R2EDVJ105A	Carbon 1M	1/4W	±5 %
R15,16	R2EDVJ392A	Carbon 3.9k	1/4W	±5 %
R17,18 19,20	R2EDVJ101A	Carbon 100	1/4W	±5 %
R21,22	R2EDVJ332A	Carbon 3.3k	1/4W	±5 %
R23,24	R2EDVJ183A	Carbon 18k	1/4W	±5 %
R25,26	R2EDVJ474A	Carbon 470k	1/4W	±5 %
R27,28	R2EDVJ104A	Carbon 100k	1/4W	±5 %
R29,30	R2EDVJ122A	Carbon 1.2k	1/4W	±5 %

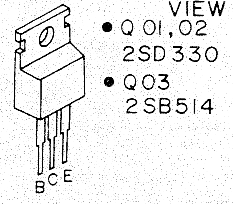
POWER SUPPLY P.C.BOARD


PRE TONE P.C.B PIN NO.4 (+B20.1 V)
C03 (−B 53.9V)
RF IF MPX P.C.B PIN NO.7
PROTECTOR P.C.B PIN NO.1
PRE TONE P.C.B PIN NO.8 EQ P.C.B (−B21.1 V)
C03 (+B 53.9 V)
PRE TONE P.C.B PIN NO.7 EQ P.C.B (+B21.4 V)
POWER TRANS
PROTECTOR P.C.B PIN NO.4 (+B13.7V)
4-2269-29260
R04 100/2W
R09 390/1W
R02 270
C06 470/25
D05
C07 220/16
Q03
R03 270
R11 820
C08 470/35
R01 10/1W
Q01
R10 820
D07
C11 220/35
C12 220/35
C01 0.01
C04 0.01
C03 0.01
C02 0.01
C05 1000/35
D01
D04
D03
D02
R05 100/2W
Q02
R06 390/1W
R08 1K
R07 1K
D06
C09 220/35
C10 220/35

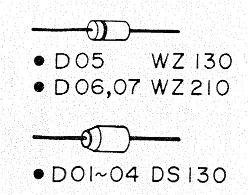
TRANSISTOR DC VOLTAGES				
SYMBOL NO.	DEVICE	B	C	E
Q01	2SD330	13.0V	18.9V	12.41V
Q02	2SD330	22.0V	39.7V	21.4V
Q03	2SB514	−21.7V	−39.9V	−21.1V

BOTTOM VIEW

TRANSISTOR FRONT VIEW


• Q 01,02
2SD330
• Q03
2SB514
B C E

DIODE FRONT VIEW


• D05 WZ 130
• D06,07 WZ 210
• D01~04 DS 130

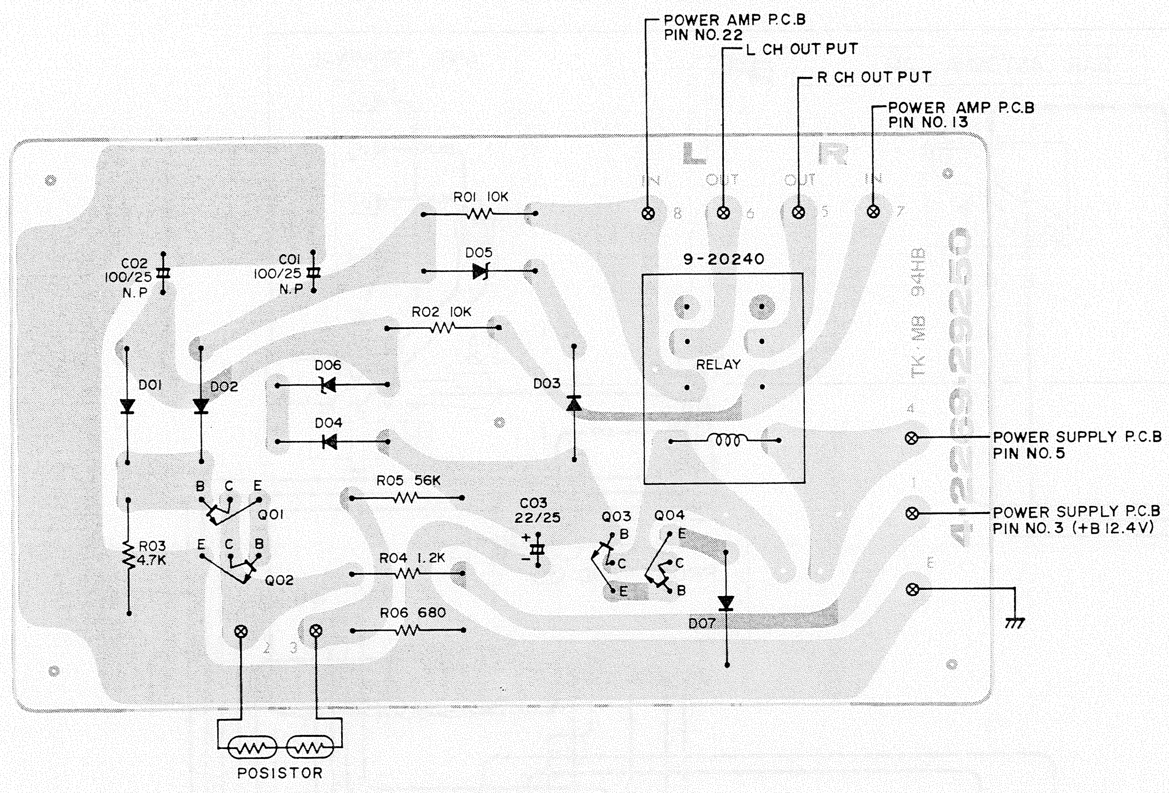
PARTS LIST

POWER SUPPLY PCB Assy
1310 4001 73002

Ref. No.	Part Number	Description
	CAPACITORS	
C01,02 03,04	C2HYDP103A	Ceramic 0.01 μF 500V +100,−0 %
C05	C1VRE-108A	Electrolytic 1000 μF 35V
C06	C1ERE-477A	Electrolytic 470 μF 25V
C07	C1CRE-227A	Electrolytic 220 μF 16V
C08	C1VRE-477A	Electrolytic 470 μF 35V
C09,10 11,12	C1VRE-227A	Electrolytic 220 μF 35V
	SEMICONDUCTORS	
D01,02 03,04	2025 2310 13020	Diode DS130YD
D05	DJJ-WZ-130	Diode WZ-130
D06,07	DJJ-WZ-210	Diode WZ-210
Q01,02	2035 8220 33050	TR 2SD330 E
Q03	2035 6460 51440	TR 2SB514 D

Ref. No.	Part Number	Description		
	RESISTORS			
R01	R3AXBJ100A	Oxide Metal Film 10	1W	±5 %
R02,03	R2EDVJ271A	Carbon 270	1/4W	±5 %
R04,05	R3DXBJ101A	Oxide Metal Film 100	2W	±5 %
R06,09	R3AXBJ391A	Oxide Metal Film 390	1W	±5 %
R07,08 10,11	R2EDVJ102A	Carbon 1K	1/4W	±5 %

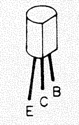
PROTECTOR P.C.BOARD


POWER AMP P.C.B PIN NO.22
L CH OUT PUT
R CH OUT PUT
POWER AMP P.C.B PIN NO.13
L
R
IN
OUT
OUT
IN
8
6
5
7
R01 10K
D05
9-20240
C02 100/25 N.P
C01 100/25 N.P
R02 10K
RELAY
D01
D02
D06
D04
D03
TK·MB 94HB
4 2269 29250
POWER SUPPLY P.C.B PIN NO.5
B C E
Q01
R05 56K
C03 22/25
Q03
Q04
POWER SUPPLY P.C.B PIN NO.3 (+B 12.4V)
R03 4.7K
E C B
Q02
R04 1.2K
R06 680
D07
2
3
POSISTOR

BOTTOM VIEW

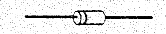
TRANSISTOR DC VOLTAGES				
SYMBOL NO.	DEVICE	B	C	E
Q01	2SC536	0.02V	5.55V	0.045V
Q02	2SC536	0.045V	5.55V	0V
Q03	2SC536	2.16V	1.62V	1.5V
Q04	2SC1175	1.5V	1.62V	0.74V

TRANSISTOR FRONT VIEW

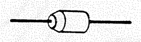


- Q01 ~ 03 2SC536
- Q04 2SC1175

DIODE FRONT VIEW



- D01~04 DS-442
- D05,06 RD-6.2E



- D07 DS-130

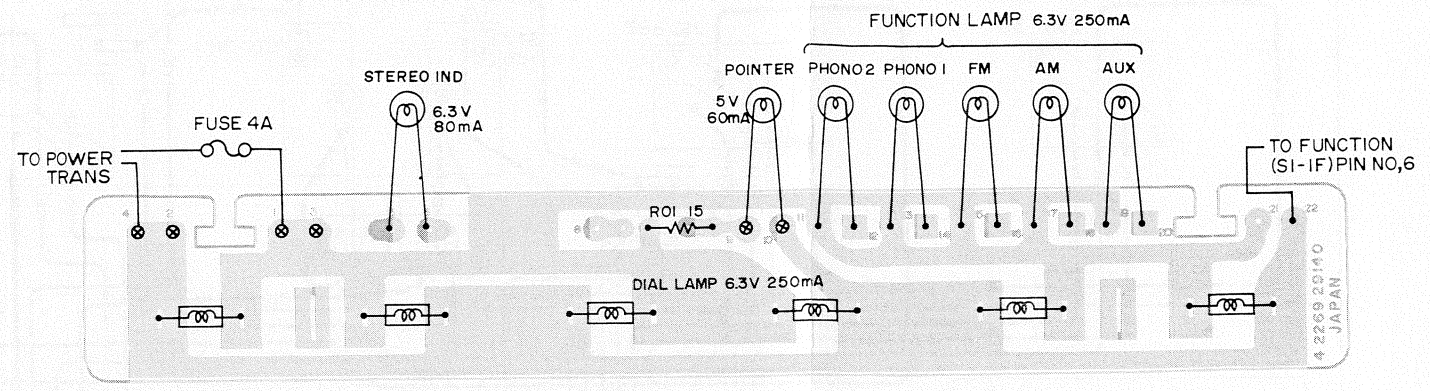
PARTS LIST

PROTECTOR PCB Assy
1310 4001 72900

Ref. No.	Part Number	Description
	4 2329 20240	Relay
	CAPACITORS	
C01,02	C1EAEN107A	Electrolytic 100 μF 25V ±30 %
C03	C1ERE-226A	Electrolytic 22 μF 25V
	SEMICONDUCTORS	
D01,02 03,04	2055 9040 44210	Diode DS-442
D05,06	DNN-RD6.2E	Diode RD-6.2 E
D07	2025 2310 13020	Diode DS130 YD
Q01,02 03	2035 5100 53650	TR 2SC536 E
Q04	2035 6701 17550	TR 2SC1175 E

Ref. No.	Part Number	Description		
	RESISTORS			
R01,02	R2EDVJ103A	Carbon 10k	1/4W	±5 %
R03	R2EDVJ472A	Carbon 4.7k	1/4W	±5 %
R04	R2EDVJ122A	Carbon 1.2k	1/4W	±5 %
R05	R2EDVJ563A	Carbon 56k	1/4W	±5 %
R06	R2EDVJ681A	Carbon 680	1/4W	±5 %

DIAL LAMP P.C.BOARD


FUNCTION LAMP 6.3V 250mA
STEREO IND
POINTER
PHONO 2
PHONO 1
FM
AM
AUX
5V 60mA
6.3V 80mA
FUSE 4A
TO POWER TRANS
TO FUNCTION (SI-IF) PIN NO,6
R01 15
DIAL LAMP 6.3V 250mA
4 2269 29140
JAPAN

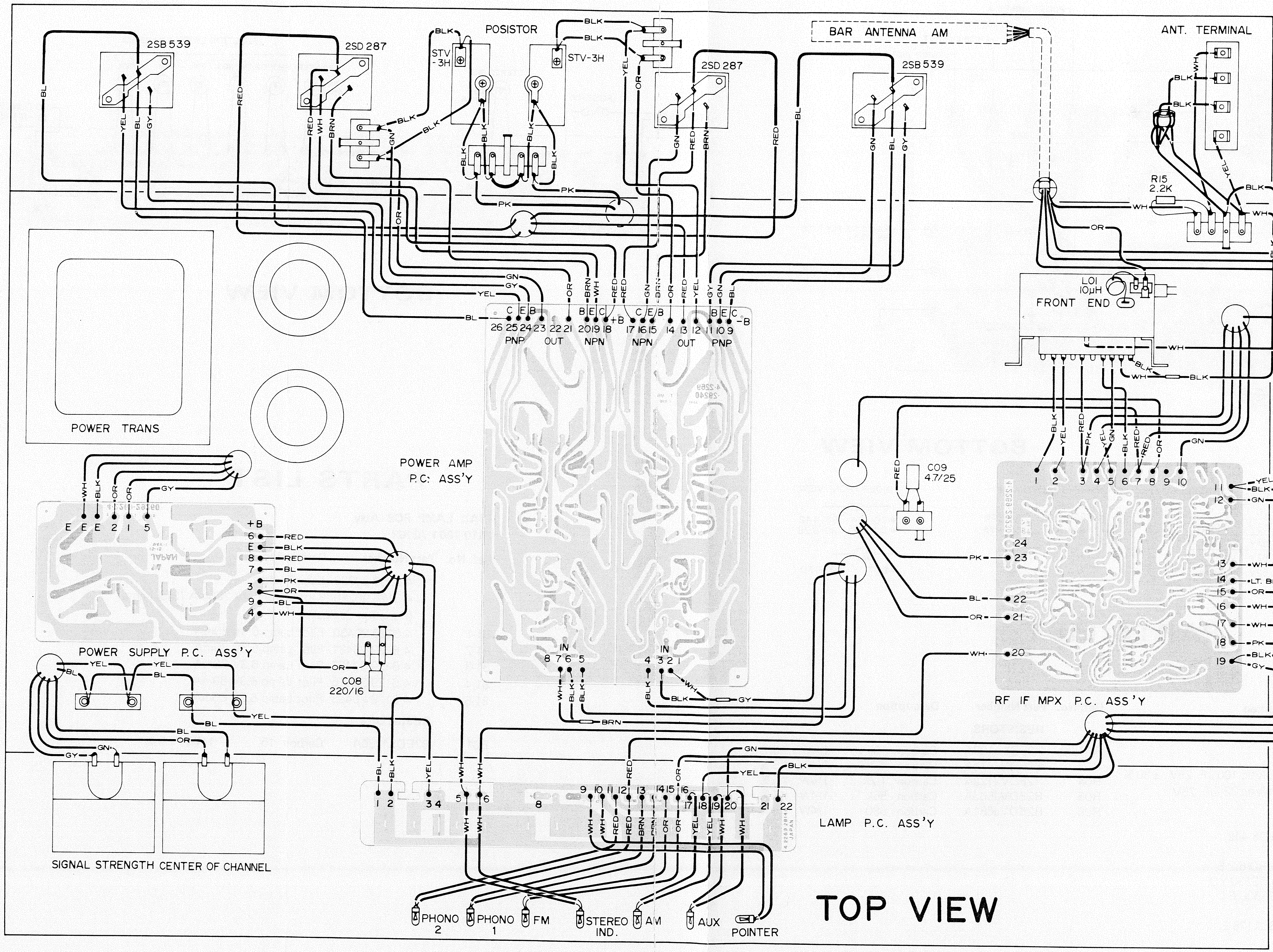
BOTTOM VIEW

PARTS LIST

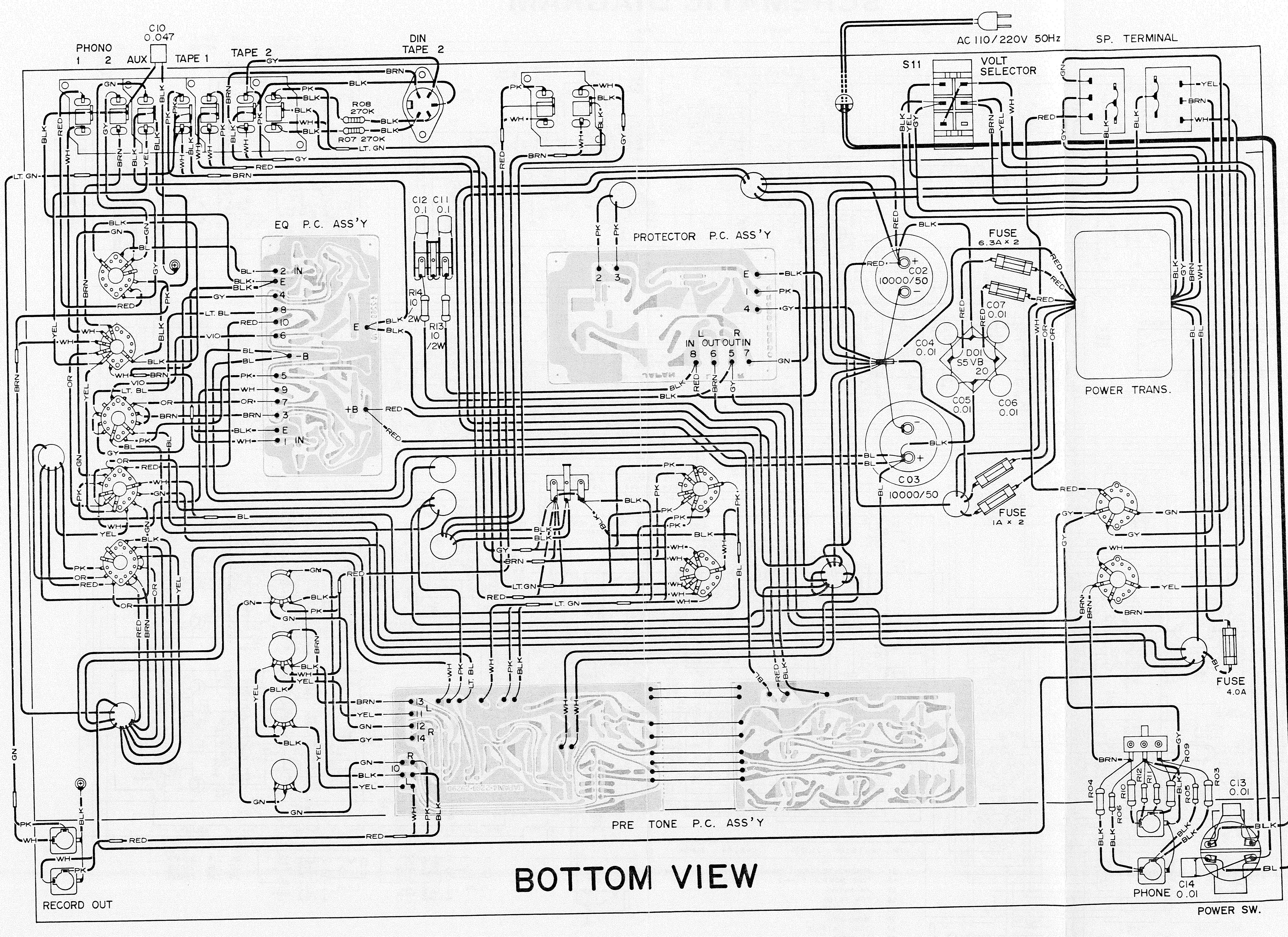
DIAL LAMP PCB Assy
1310 4001 72163

Ref. No.	Part Number	Description		
	4 2359 20930	Lamp Holder		
	4 6129 20280	Pilot Lamp 6.3V 250mA (Dial Lamp)		
	(Function Lamps)			
81-1	4 6129 20430	Pilot Lamp 6.3V 80mA		
81-2	4 6129 20431	Pilot Lamp 6.3V 80mA		
81-3	4 6129 20432	Pilot Lamp 6.3V 80mA		
81-4	4 6129 20216	Pilot Lamp 6.3V 80mA		
81-5	4 6129 20433	Pilot Lamp 6.3V 80mA		
	RESISTORS			
R01	R2EDSJ150A	Carbon 15	1/4W	±5 %

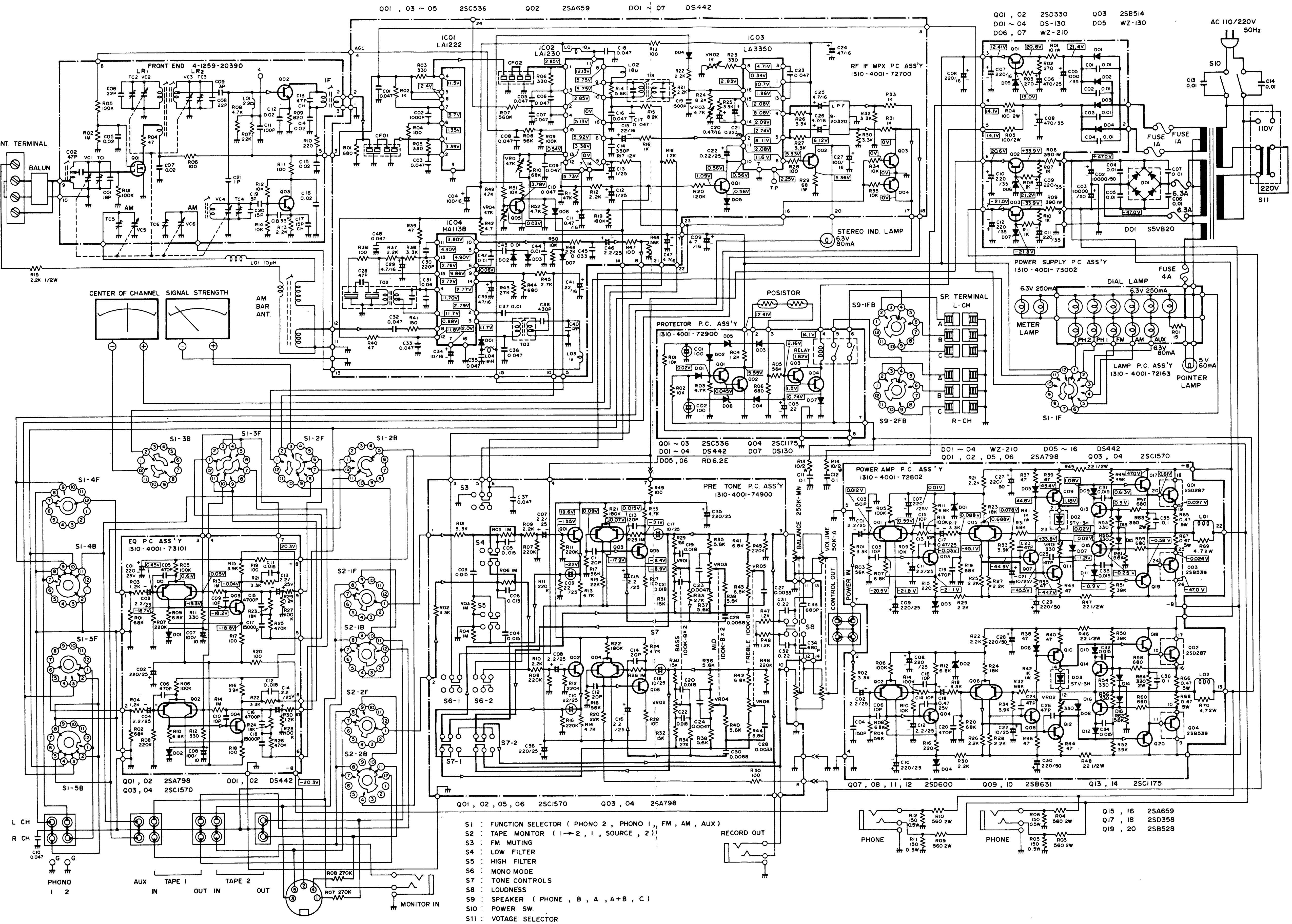
POINT TO POINT WIRING DIAGRAM


2SB539
2SD287
POSISTOR
STV -3H
STV-3H
2SD287
2SB539
BAR ANTENNA AM
ANT. TERMINAL
R15 2.2K
L01 10μH
FRONT END
POWER TRANS
C E B
B E C +B
C E B
B E C -B
26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9
PNP OUT NPN NPN OUT PNP
POWER AMP P.C: ASS'Y
IN 8 7 6 5
IN 4 3 2 1
C09 4.7/25
RF IF MPX P.C. ASS'Y
E E E 2 1 5
+B 6 E 8 7 3 9 4
POWER SUPPLY P.C. ASS'Y
C08 220/16
SIGNAL STRENGTH CENTER OF CHANNEL
1 2 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
LAMP P.C. ASS'Y
PHONO 2
PHONO 1
FM
STEREO IND.
AM
AUX
POINTER
TOP VIEW

POINT TO POINT WIRING DIAGRAM


PHONO
1
2
AUX
C10
0.047
TAPE 1
TAPE 2
DIN
TAPE 2
R08
270K
R07 270K
AC 110/220V 50Hz
SP. TERMINAL
S11
VOLT
SELECTOR
EQ P.C. ASS'Y
C12 C11
0.1 0.1
R14
10
2W
R13
10
/2W
PROTECTOR P.C. ASS'Y
L
R
IN OUT OUT IN
8 6 5 7
FUSE
6.3A × 2
C02
10000/50
C07
0.01
C04
0.01
D01
S5VB
20
C05
0.01
C06
0.01
C03
10000/50
POWER TRANS.
FUSE
1A × 2
FUSE
4.0A
PRE TONE P.C. ASS'Y
R04
R06
R10
R12
R11
R05
R09
R03
C13
0.01
PHONE
C14
0.01
POWER SW.
RECORD OUT
BOTTOM VIEW

SCHEMATIC DIAGRAM


Q01 , 03 ~ 05 2SC536 Q02 2SA659 D01 ~ 07 DS442
FRONT END 4-1259-20390
ANT. TERMINAL
AM
300Ω
75Ω
BALUN
AM BAR ANT.
IC01 LA1222
IC02 LA1230
IC03 LA3350
IC04 HA1138
RF IF MPX P.C ASS'Y 1310-4001-72700
STEREO IND. LAMP 6.3V 80mA
CENTER OF CHANNEL
SIGNAL STRENGTH
POSISTOR
PROTECTOR P.C. ASS'Y 1310-4001-72900
Q01 ~ 03 2SC536 Q04 2SC1175
D01 ~ 04 DS442 D07 DS130
D05 , 06 RD6.2E
Q01 , 02 2SD330 Q03 2SB514
D01 ~ 04 DS-130 D05 WZ-130
D06 , 07 WZ-210
POWER SUPPLY P.C ASS'Y 1310-4001-73002
AC 110/220V 50Hz
S10
S11
110V
220V
FUSE 1A
FUSE 4A
D01 S5VB20
DIAL LAMP
6.3V 250mA
METER LAMP
LAMP P.C. ASS'Y 1310-4001-72163
POINTER LAMP 5V 60mA
SP. TERMINAL L-CH
R-CH
S9-1FB
S9-2FB
S1-1F
S1-3B
S1-3F
S1-2F
S1-2B
S1-4F
S1-4B
S1-5F
S1-5B
S2-1F
S2-1B
S2-2F
S2-2B
EQ P.C ASS'Y 1310-4001-73101
Q01 , 02 2SA798 D01 , 02 DS442
Q03 , 04 2SC1570
PRE TONE P.C. ASS'Y 1310-4001-74900
Q01 , 02 , 05 , 06 2SC1570 Q03 , 04 2SA798
S3
S4
S5
S6-1
S6-2
S7
S7-1
S7-2
S8
BASS 100K-B×2
MID 100K-B×2
TREBLE 100K-B×2
BALANCE 250K-MN
VOLUME 50K-A
CONTROL OUT
POWER IN
D01 ~ 04 WZ-210 D05 ~ 16 DS442
Q01 , 02 , 05 , 06 2SA798 Q03 , 04 2SC1570
POWER AMP P.C ASS'Y 1310-4001-72802
Q07 , 08 , 11 , 12 2SD600 Q09 , 10 2SB631 Q13 , 14 2SC1175
Q15 , 16 2SA659
Q17 , 18 2SD358
Q19 , 20 2SB528
PHONE
PHONE
RECORD OUT
L CH
R CH
PHONO 1 2
AUX
TAPE 1 IN OUT
TAPE 2 IN OUT
MONITOR IN

S1 : FUNCTION SELECTOR (PHONO 2 , PHONO 1 , FM , AM , AUX)
S2 : TAPE MONITOR (1→2 , 1 , SOURCE , 2)
S3 : FM MUTING
S4 : LOW FILTER
S5 : HIGH FILTER
S6 : MONO MODE
S7 : TONE CONTROLS
S8 : LOUDNESS
S9 : SPEAKER (PHONE , B , A , A+B , C)
S10 : POWER SW.
S11 : VOTAGE SELECTOR